NOVEMBER 1994
Volume 62 No 11

AMATEUR RADIO

Journal of the Wireless Institute of Australia

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CONTENTS

Technical
Low Radiators and High Ground Planes — 10
William A McLeod VK3MI
Technical Abstracts
Overvoltage Protection — 20
Novel VHF Power Amplifier — 21
Gil Sones VK3AUI

General
IARU Region 3 Ninth Regional Conference — 4
Kevin Olds VK1OK
SMA's New Policy on Handling Interference From Transmitters — 15
Spectrum Management Agency
Book Review — The Radio Amateur's Guide to EMC — 23
Gil Sones VK3AUI

Operating
Awards
DX Profiles — 30
Local Awards — 31
The Solitary Islands Award — 31

Contests
ALARA Contest Rules — 33
IARU Region 1 160 m CW Contest Rules — 33
ARRL 160 m DX CW Contest Rules — 34
ARRL 10 m Contest Rules — 34
ARRL RTTY 1993 Contest Results — 34
CQ WW RTTY 1993 Contest Results — 34
Australasian Sprints 1994 Results — 34
Ross Hull Memorial VHF-UHF Contest 1994-5 Rules — 34

Columns
Advertisers Index — 56
ALARA — 22
AMSAT Australia — 26
An Old Timer Reflects — 42
Club Corner — 32
Divisional Notes
VK6 Notes — 36
VK7 Notes — 36
Editor's Comment — 3
Federal QSP — 2
FTAC Notes — 41
Hamads — 54
HF Predictions — 52
How's DX? — 37
Intruder Watch — 45
Over To You — 45
Packet World — 43
Pounding Brass — 41
QSP News — 31, 55
Repeater Link — 42
Silent Keys — 49
Spotlight on SWLing — 51
Technical Correspondence — 46
VHF/UHF — An Expanding World — 47
VK QSL Bureaux — 56
What's New — 51
WIA News — 9, 13, 26, 32, 51
WIA — Divisional Directory — 3
WIA — Federal Directory — 2

Cover

Two Christines — Presidents across the world. Christine Haycock WB2YBA, President of the Young Ladies Radio League (YLRL) for the second time (on the left) and Christine Taylor VK5CTY, President of the Australian Ladies Amateur Radio Association (ALARA).

Christine WB2YBA has received many awards for her work as a surgeon, and her leisure activities, apart from amateur radio, include the breeding and judging of miniature schnauzers and photography. Christine is sponsored into ALARA by Mavis VK3KS and is also a member of the WIA.

Christine VK5CTY, after rearing four children, gained her B Ed and taught for a number of years before retiring. Her leisure activities, apart from amateur radio, include many craft activities and enjoying all aspects of her home-away-from-home in the bush. She is an official WIA examiner for the amateur exams.

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A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Federal QSP

It is now about fourteen years since I first attended a Federal Convention. At that time I was the "Alternate Federal Councillor" from VK5 and Federal Conventions were three day events held at the Brighton Savoy Motel in April each year.

At that time there was much pressure to get through the agenda items as there wouldn't be another opportunity to make WIA policy for another twelve months. Between conventions the Councillors sometimes did little and the implementation of policies was carried out by the "Executive". Often the extant policies were unclear, or even non-existent, and so the Executive, in order to function effectively, had to make decisions which some Divisions thought were outside its role. This inevitably led to some ill feeling.

After a break, I returned to the Federal scene some years ago as the VK5 Federal Councillor, and became the first Councillor to be elected to the Executive. This was a move to try to break down some of the hostility felt in some Divisions. This was the first of a number of recent changes to the operation of the Federal Council and Executive. Federal Conventions became quarterly in order to speed up the decision making process. Then the Federal Councillors effectively became the Executive and had to wear both hats.

Since that time the Federal Council, acting either in "Convention", or in "Executive" as the WIA Board, has endeavoured to take much more responsibility for the quality of WIA policies and for the execution of them. As a company board of directors we were impressed by the legal responsibility we carried as board members.

You may have noticed on the mast head of *Amateur Radio* that my name appears as the "Publisher's Nominee". In the past, the publisher was nominally the Company Secretary acting on behalf of the Council. This change is another example of the Council taking more responsibility for the implementation of its policies. The publisher of a magazine is responsible for ensuring that its content is not libellous, offensive or in breach of a number of regulations. Since the Council is ultimately responsible we felt that it was more appropriate that a Federal Councillor should carry the can, rather than an employee.

In this role I will be perusing the final proofs of the magazine with a view to ensuring that the magazine does not contain material which may be libellous or offensive to any individual, or to any of the WIA's member Divisions, and is unlikely to embroil the organisation in legal proceedings. *Amateur Radio* is the WIA's "in house" journal and as such should carry technical articles and news relevant to our hobby. Material likely to cause dissension between amateurs or commenting upon the internal affairs of a Division should not be published.

Bill Wardrop VK5AWM
Federal Councillor for VK5
ar

Editor's Comment

More About Repeaters

Nearly every month I find, to my surprise, that I begin by referring to the previous month's Comment. I'm not going to break the habit this time, either! But this time, also, I must refer to an article published last month on the setting up of a packet repeater (page 22 of October *Amateur Radio*).

VK6RWR has been a most commendable effort by a small group of enthusiasts in the North West. As mentioned last month, VK3s OM and ABP were up that way last July on a caravan trip around the WA coast. We had no packet equipment with us, so we had no direct involvement, but we did have 2 metre FM voice transceivers, and the presence of an enthusiastic local group was very much apparent.

". . . some new 'blood' is needed."

Essentially the same people as those behind 6RWR are also responsible for linking a number of voice repeaters from Port Hedland to Karratha. The result is that mobile stations can work freely with locals and each other from well north of Port Hedland to somewhere near the Fortescue River, a distance of several hundred kilometres. The system operates very well indeed, and we were pleased to talk on the net to several of its originators, notably VK6YA and VK6DLB. A job very well done, gentlemen!

At a recent Publications Committee meeting the topic of members' length of involvement with the committee was discussed. Several have been members for a number of decades and, while still participating actively, cannot be expected to remain active indefinitely.

We feel that some new "blood" (preferably younger blood!) is needed. So, if any of you, living in the

Continued on page 55

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division	Address	Officers			Weekly News Broadcasts		1994 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Rob Apathy Len Jones Don Hume	VK1KRA VK1NLJ VK1DH	3.570 MHz LSB, 146.950 MHz FM, 438.525 MHz FM each Monday evening (except the fourth Monday) commencing at 8.00 pm. Repeated on Wednesday evening at 8.00 pm on 146.950 MHz FM.	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124) Phone (02) 689 2417 Freecall 1800 817 644 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Michael Corbin Pixie Chapple Terry Ryeland Mon-Fri 11.00-14.00 Mon 1900-2100)	VK2PFQ VK2KPC VK2UX	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 52.120, 52,525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 70 cm, 23 cm. Voicemail highlights on (02) 724 8793. The broadcast text is available on packet.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer (Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530)	VK3PC VK3XV VK3XLZ	1.840MHz AM, 3.615 LSB, 7.085 LSB, 53.900 FM(R) Mt Dandenong, 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 146.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (07) 284 9075	President Secretary Treasurer	Murray Kelly Lance Bickford Roger Bingham	VK4AOK VK4ZAZ VK4HD	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz. 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Garry Herden Maurie Hooper Bill Wardrop	VK5ZK VK5EA VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555, 7065, 10125, 146.700, 0900 hrs Sunday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 434 3283	President Secretary Treasurer	Cliff Bastin Ray Spargo Bruce Hedland-Thomas	VK6LZ VK6RR VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 148 Derwent Avenue Lindisfarne TAS 7015 Phone (002) 43 8435	President Secretary Treasurer	Andrew Dixon Ted Beard Phil Harbeck	VK7GL VK7EB VK7PU	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$69.00 $55.65 $40.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

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■ Administration

IARU Region 3 Ninth Regional Conference

Kevin Olds VK1OK details how the WIA represented Australian radio amateurs at a recent international conference*

Introduction

The Ninth Regional Conference of the International Amateur Radio Union (IARU), Region 3, was held at the Apollo Hotel in Singapore from 5 to 9 September 1994. The conference was attended in person by 18 member societies while a further three societies were represented by proxies. This was a record attendance from the 25 societies which comprise IARU Region 3. The attending societies were:

American Radio Relay League
Amateur Radio Society of India
Bangladesh Amateur Radio League
Chinese Radio Sports Association
Chinese Taipei Amateur Radio League
Japan Amateur Radio League
Hong Kong Amateur Radio Transmitter Society
Korean Amateur Radio League
Malaysian Amateur Radio Transmitter Society
New Zealand Amateur Radio Transmitters
Organisasi Amateur Radio Indonesia
Philippines Amateur Radio Association
Pakistan Amateur Radio Society
Radio Amateur Society of Thailand
Radio Society of Great Britain
Radio Society of Sri Lanka
Singapore Amateur Radio Transmitting Society
Wireless Institute of Australia
Represented by proxy were:
Fiji Amateur Radio Society
ARCOT (Tonga)
Solomon Islands Radio Society

Also present were representatives from the IARU, IARU Regions 1 and 2, the ITU, Asia Pacific Telecommunity (APT) and an observer from Vietnam.

The WIA delegation comprised:
Delegate: Kevin Olds VK1OK
Observers: Roger Harrison VK2ZRH
John Aarsse VK4QA
Gavan Berger VK1EB
Wally Watkins VK4DO
Brenda Edmonds VK3KT

Both Wally Watkins and Brenda Edmonds had financed their own attendance. The remainder were funded by the WIA.

Conference Workings

Although the conference proper did not commence until Monday, 5 September, a delegates' meeting was held on the evening of Sunday, 4 September. This meeting was instituted at the previous conference. The primary aim of the meeting was to determine the composition of the conference committees, namely the Credentials and Elections Committee, the Finance Committee and the Editorial Committee. There is also provision for a Steering Committee to assist the Conference Chairman but the delegates did not feel the need for the Steering Committee and left the decision to the Conference Chairman when elected. The WIA was represented on the Finance Committee by Kevin Olds and Gavan Berger and on the Editorial Committee by Roger Harrison.

The Conference was opened on Monday, 5 September by the Minister of State, Trade & Industry and Communications, Mr Goh Chee Wee. The Conference was also addressed at the opening ceremony by Mr K C Selvadurai the President of the Conference, Mr Hyun Wook Shi from APT Bangkok, Mr Graham Davey the ITU Regional Representative and Mr Dick Baldwin the President of IARU. Following the opening ceremony, the conference elected Mr K C Selvadurai, the President of the Singapore Amateur Radio Transmitters Society, as Conference Chairman.

With the formalities out of the way, the conference got down to serious business. The conference met in plenary session for the remainder of the Monday and then again on Tuesday morning. The next plenary session was not held until Thursday afternoon with the final plenary session and the closure of the conference being held on the Friday morning.

The bulk of the work of the conference was undertaken by two

On the dais for the opening ceremony at the IARU Region 3 conference were, left to right:- Masayoshi Fujioka, Secretary IARU Region 3; David Rankin, Chairman of Directors; Mr K C Selvadurai, President of the Conference; Mr Goh Chee Wee, Minister of State, Trade and Communications; Mr Graham Davey, ITU Regional Representative; Mr Hyun Wook Shi, APT Bangkok; and Dick Baldwin, President of the IARU.

Photo by Barbara Olds VK1MTB

working groups and the Finance Committee. At the Tuesday plenary session, the conference established two working groups:

- Working Group A, convenor Terry Carrell ZL3QL, which addressed the administrative and operational agenda items. The WIA was represented on this group by VK2ZRH, VK4QA, VK4DO and VK3KT;
- Working Group B, convenor Kevin Olds VK1OK, which addressed the technical agenda items. The WIA was further represented on this group by VK1EB and VK2ZRH.

There was some overlap of attendees at the two working groups as some delegations could not provide an attendee at each and some individual delegates or observers had interests in matters to be considered by each group.

Working Group A was the larger group, comprising over 50 delegates and observers. John Aarsse VK4QA, was appointed by the group to assist the Convenor. The working group had many items to consider, most of which were considered by the group as a whole. However, a sub working group was established to consider the Promotion of Amateur Radio issues and authorised by the working group to report separately to the conference. Roger Harrison VK2ZRH was the convenor of this sub working group and the WIA was further represented by VK3KT.

Working Group B was the smaller group with about 25 delegates and observers. This group met as a whole for all its deliberations as no item required detailed consideration which could not be provided by the group as a whole.

In addition to the various plenary and working group sessions, there were also three receptions held at which the attendees could relax and discuss things in a less formal atmosphere. The first was held on the Monday night, hosted by Host Society, SARTS. The Wednesday evening reception was hosted by JARL. The IARU International Secretariat in conjunction with the ARRL hosted the final reception on the Friday night.

Free time for the attendees was very limited, but we were able to see some of Singapore and appreciate the beauty of the country and its energy and vitality.

Major Conference Results

The conference provided an opportunity not only to consider those items which were on the agenda but also talk with delegates from other societies and discuss matters of mutual interest. Despite differences in culture, many of the problems which beset us in amateur radio are common to other societies. One can also continue to appreciate how fortunate we are in terms of the administration of amateur radio in this country, the degree of freedom we experience and the good relationship we have with the SMA. Many other societies are not so fortunate and it is through these conferences that we are able to assist them in their

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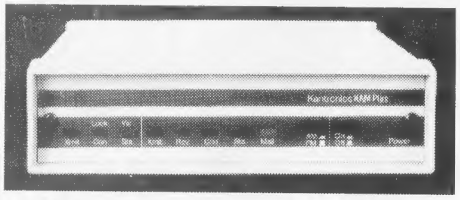

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negotiations with their administrations to obtain a freer environment for amateur radio in their countries. The major outcomes of the conference are best considered under the headings of the major working groups.

Finance

The major factor affecting the finances of Region 3 is the decision of the IARU to levy each of the Regions 10% of their membership income to fund the increasing representation of amateur radio by the IARU. This activity had grown significantly in recent years and the IARU has been forced to raise this levy to provide a source of funding for this activity. This levy has been payable from this current financial year and represents a major unbudgeted expenditure item which will be covered by the reserves for this year.

For the next triennium, an increase in membership fees is required.

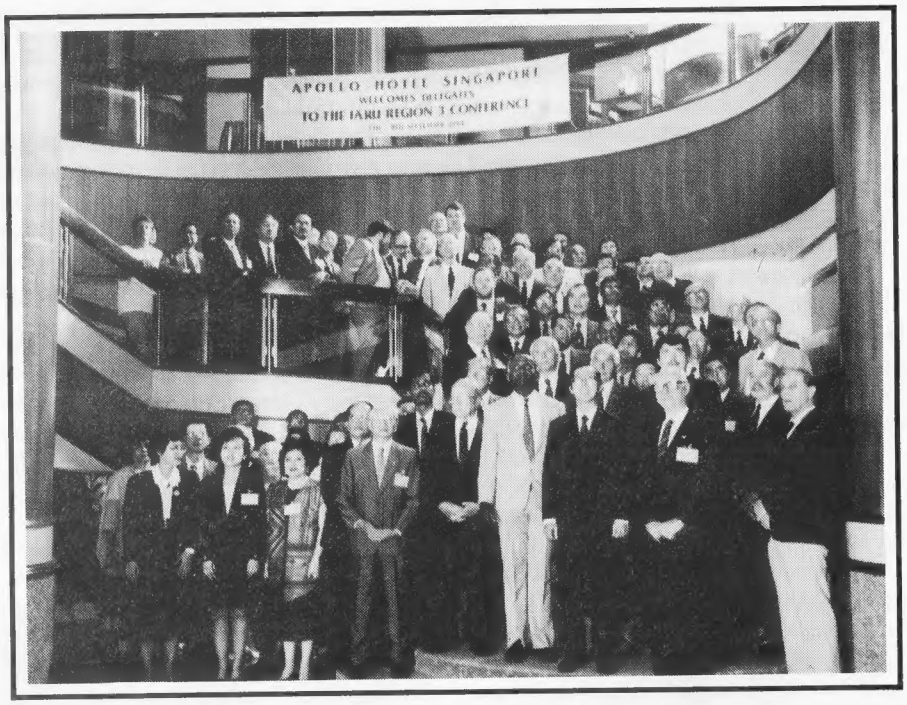
In considering the budget, this was the major variation from previous years. Other expenses are expected to increase only slightly. It must be noted, however, that the JARL is funding some of the operations of the Secretariat. This is estimated to be about $US30,000 per annum, a significant amount given that the normal income for the Region is only now just exceeding $US40,000.

The subscription for the next three years has been set as follows:

0-5,000 members	$US 0.71 per member
5,001-10,000 members	$US 0.44 per member
All over 10,000	$US 0.12 per member

In addition, in recognition of the high cost of foreign exchange transactions, both to member societies as well as to Region 3, it has been necessary to introduce a minimum subscription of $US25 per year for all societies. This affects those societies with less than 35 members. To ease the burden of this increase for some societies and further minimise the costs of foreign exchange, those societies which pay the minimum subscription can, if they wish, pay the full triennial fee in a single amount in the second year of the triennium.

The conference also decided to take to itself the task of appointing the auditors for Region 3. The Region has only had an auditor since 1991 and this was appointed by the Directors. Having Conference appoint the auditors is consistent with company practice in Australia, New Zealand and many other countries of the region.



A group photo of the delegates to the IARU Region 3 conference.
Photo by Barbara Olds VK1MTB

Administrative and Operational

Some 20 recommendations from the working group, in addition to several from the sub-working group on promotion of amateur radio, were adopted by the conference. The more important recommendations were:

Policy

There are numerous organisations whose deliberations are relevant to the development of amateur radio in this region, such as the Asian Broadcasting Union, the Asia-Pacific Telecommunity and the Asia Pacific Economic Cooperation Forum. It was decided to authorise the Directors to seek admission to, and representation at, meetings of external organisations such as these when it is considered necessary.

The IARU Administrative Council has undertaken a number of initiatives with respect to representation of the amateur radio service at the international level. These include:

- the development of a strategic plan, with budget, for the representation of the amateur radio service at the international level;
- the establishment of a Group of Experts from which the President of the IARU shall select people required to represent IARU at specific meetings.

IARU Administrative Council resolutions concerning the irrelevancy of type approval of amateur radio equipment and the regular inspection of amateur radio stations were adopted. Where relevant, societies are encouraged to pursue this with their administrations.

Satellites

The Phase 3D satellite program was endorsed with member societies being urged to raise funds within their own borders for this project and report those fund raisings to the Region 3 Secretariat.

It was recommended that the IARU create two positions covering satellite activities internationally, an IARU Satellite Liaison Office and an IARU Satellite Coordinator. The IARU Satellite Coordinator would report to the Satellite Liaison Officer and would

concentrate on working closely with AMSAT Groups.

Wind Profiler Radar

As Wind Profiler Radar moves from the experimental to a fully operational phase, ITU-R established in 1992 TG8/2 of Study Group 8 to discuss the related issues. This group was chaired by Paul Rinaldo W4RI, the Technical Manager of ARRL. Both Paul and JARL have done excellent work within TG8/2 in support of amateur radio. All societies will need to monitor wind profiler radar development in their areas.

Commonly Accepted Amateur Licenses

Considerable discussion arose in this area, especially in regard to the CEPT and CITEL proposals. The CEPT proposal has arisen within the European Community in Region 1 while CITEL is an organisation of American states which is similar to CEPT. The concept of a common amateur licence is generally endorsed but there is, as yet, no plan of action. However, the conference recommended that societies obtain simplified reciprocal operating and licensing procedures by an international amateur radio permit or by the CEPT recommendations TR61-02. Member societies were also urged to have their administrations recognise and extend existing informal arrangements.

Effective Representation of Radio Amateurs

An IARU Administrative Council resolution addressing the means of ensuring that a common voice speaks for amateur radio was adopted. The emergency communications aspects of amateur radio addressed in the WIA's paper on representation of radio amateurs generated considerable interest. There would seem to be room here for more international co-operation in this area.

Region 3 News

Although he is retiring as Secretary, Masayoshi Fujioka JM1UXU has stated that he would continue as editor of Region 3 News. As Editor, he was empowered to establish a roster system for member societies to supply copy for publication. For the next edition ARRL, CRSA and NZART are on the roster.

Requirement for Morse Code Ability

The conference confirmed support for the continuation of the Morse Code requirement for operation on the HF Bands.

Information Program for Handicapped Radio Amateurs (IPHA)

IPHA is run enthusiastically by the IARU Region 1 IPHA co-ordinator, Agnes Tobbe-Klasse Bos PA3ADR. IPHA is concerned about gathering information for dissemination to others on organisations, nets, equipment, etc for disabled radio amateurs as well as special courses and methods for the disabled to become radio amateurs. The conference commended this work to member societies and encouraged member societies to develop their own programs in this area and provide details to the Region 1 co-ordinator and the Region 3 Secretariat.

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Mongolian Radio Sports Federation

Although technically in Region 1, the MRSF has more ties to Region 3. JARL had proposed that the MRSF be treated as a member of Region 3. This was accepted by the conference for the purposes of ARDF activities and Promotion of Amateur Radio. Actual membership of Region 3 by MRSF would be dependent on a boundary change through the ITU.

Promotion of Amateur Radio in Developing Countries

The conference adopted the name "Service in Region 3", or STARS * * * for short, to describe all the promotional and support activities necessary in all the countries and societies in the Region, regardless of their state of development.

The vital importance of the acceptance of amateur radio by a country's administration was acknowledged. In this respect the Amateur Radio Administrative Forums promoted by the IARU, JARL and APT were of great significance.

The members of the previous PAR Task Force reconfirmed their membership of the STARS * * * Task Force. A detailed set of recommendations covering many aspects of STARS * * * activities within the Region was presented by the subworking group and adopted.

Amateur Radio Direction Finding (ARDF)

ARDF is an area of increasing activity, both within Region 3 and elsewhere. It is a pedestrian fox hunt for multiple transmitters in sequence where the activity is anything but "pedestrian". A combination of orienteering and foxhunting would be another way of looking at it. The conference endorsed the rules for the Region 3 ARDF championships and appointment of Region 3 International Class Referees. In addition, the International Referees qualified by the ARDF Committee were approved.

Australian amateurs will have an opportunity to see this activity first hand and participate if they wish as the next Region 3 ARDF Championships will be held in Townsville. The exact timing will be determined after the Region 1 Championships this year. The likely timing is 1996.

Technical

A total of 25 recommendations from the working group were adopted by the conference. The following provides a summary of the more important recommendations:

Beacons

A position of IARU Region 3 Beacon Co-ordinator was established and funding provided in the budget. One of the tasks for the Co-ordinator will be to foster the establishment of beacons on 10 m, 6 m and 2 m. Roger Harrison VK2ZRH, has offered his services for this position. The Directors will be making an appointment in the near future.

Region 3 is embracing the International Beacon Project. As part of that project, the conference has decided to approve the establishment of IBP time share beacons in Japan (already operational), New Zealand, Eastern Australia, Taiwan, Sri Lanka and Western Australia. With the exception of the Sri Lanka beacon, which will be funded by JARL, all beacons are to be funded by the society concerned. Operation and maintenance of the beacon is the responsibility of the individual society.

The conference recommended that the IARU address the question of beacons below 14 MHz and also the establishment of an international effort to monitor propagation through the beacons and provide a clearing house for reports.

Band Plans

The Region 3 Band Plan for 144 MHz was amended to raise the EME segment from 144.025 MHz to 144.035 MHz in recognition of increasing activity and the extension by Region 1. Other motions related to the de-regulation of Band Plans by administrations and the need to monitor administrations in their frequency allocations above 1000 MHz to preserve common amateur bands and the need to remind administrations of Footnote 664 and 808 to the ITU International Frequency Table concerning the Amateur Satellite Service.

IARU Monitoring Service

As a result of the conference, several member societies have undertaken to become involved in the IARU Monitoring Service. Recommendations adopted include: encouraging SWLs to become involved in monitoring activities; establishing a system whereby administrations can be approached in relation to intrusions into Amateur Bands by the IARU Region 3 Monitoring Service Co-ordinator working with local societies; encouraging societies to provide equipment to their co-ordinator to undertake monitoring; and publicising both those countries which breach the Radio Regulations as well as those which take positive steps to cease such breaches.

An IARU Administrative Council Resolution on the procedures for handling intrusion reports was also adopted.

EMC and Standards

EMC and Standards are emerging areas of importance in the amateur world. The IARU Region 3 Secretariat will now undertake a co-ordination role in this area within Region 3.

Satellites

Terrestrial operation in satellite bands is again becoming a problem. The conference recommended that member societies, if they have not already done so, initiate and maintain a program of publicity and education to acquaint amateurs of the satellite portions of the bands and the need to avoid terrestrial operations in those bands.

Digimode Operations

In response to the changing nature of packet radio operations, Conference adopted the term "digimode" to refer to modes such as RTTY, Packet, AMTOR, PACTOR, GTOR, etc. The guidelines for packet radio operators and bulletin board operators adopted at the eighth conference were updated to reflect the new terminology and a few minor changes were made. All societies are urged to promulgate these guidelines to all operators. The Region also endorsed the establishment of a Sysops forum to promote efficient use of networks through the co-ordination of bulletin board activity, the implementation of the guidelines throughout the region and through liaison with similar forums in other regions.

Office Bearers

The election for the positions of Director was held during the last morning of the conference. Unfortunately, our previous Director, David Wardlaw VK3ADW, was not re-elected to the position. The new Board is:

Fred Johnson ZL2AMJ
Park Young-Soon HL1IFM
David Rankin 9V1RH
Yoshiji Sekido JJ1OEY
Sangat Singh 9M2SS

Retiring Directors David Wardlaw and Keigo Komuro JA1KAB, who did not stand for re-election, were thanked for their contributions to the work of IARU Region 3.

Dick Baldwin W1RU, President of the IARU, addresses the conference.
Photo by Barbara Olds VK1MTB.

David Rankin, the previous Chairman, had already indicated that this would be his last term as a Director and, therefore, it would be better if there were a new Chairman of Directors at this time. The new Directors proposed, and Conference accepted, the appointment of Fred Johnson as Chairman of Directors.

JARL indicated its willingness to continue to support the Secretariat and provide the Secretary. Masayoshi Fujioka JM1UXU, the previous Secretary, had already advised that he would not be available for the position. JARL proposed Keigo Komuro JA1KAB, as the new Secretary which was accepted by Conference.

The work of Masa in his 12 years as Secretary was formally acknowledged by the Conference members with many societies making presentations to him.

Future Conference Locations

The tenth Region 3 Conference will be held in Beijing, hosted by the CRSA. The date is tentatively set for 9 September. Proposals to host the tenth conference had been received from CRSA, CTARL and BARL.

The offer by the WIA to host the 11th conference in the year 2000 was considered at length. The efforts of the delegation to sell the concept to other delegations bore fruit and the proposal was passed 11 to 0 with 7 abstentions. It is now up to the WIA to live up to the promises made in its proposals to host the 11th Regional Conference.

General

In documenting the results of the conference, what has not been recorded is the response and interest generated by many of the papers submitted which were largely for the information of member societies. These papers fulfil a valuable role in the operation of the conference as they provide a catalyst for discussion, sharing of views and experiences, and establishing contacts which delegates and observers are able to take back to their own societies and use to help further amateur radio in their area.

The conference organisation by SARTS and the Region 3 Secretariat was first class and contributed to the smooth running and positive results achieved. We should not underestimate the effort that is required to successfully stage such a conference.

As the WIA delegate to the conference I was ably assisted by the rest of the delegation to whom I express my thanks.

*C/o PO Box 2175, Caulfield Junction, VIC 3161

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WIA News

Restrictions Lifted for UK Hams

Amateurs in the United Kingdom are now able to run more power on segments of the 160 m and 6 m bands. In addition, restrictions on antennas and effective radiated power (ERP) on 6 m have been lifted.

On 160 m, UK holders of the Class A license may now use 400 watts output between 1810 kHz and 1850 kHz as the power restriction on the 1810-1830 kHz segment has been lifted. However, the power limit for the 1850-2000 kHz segment is still 30 watts.

On 6 m, UK holders of the Class A and B licenses are now able to run 400 watts between 50 MHz and 51 MHz. Between 51 MHz and 52 MHz, they are still restricted to a power of 100 watts. Restrictions on ERP and antenna height which applied to the 50-52 MHz band have been removed. Maritime mobile operation on 6 m is now permitted in the UK, also.

Meanwhile, UK amateurs are now required to notify their local regulatory authority, the Radio Investigation Service (RIS), if they operate an unattended digital station. Operators have to notify their local RIS office on how to close down their station in an emergency. (Thanks to the *ARRL Letter*).

■ Antennas

Low Radiators and High Ground Planes

William A McLeod VK3MI has investigated antenna behaviour at what seem to be astonishingly small heights above ground.*

The accepted amateur criteria for horizontal HF radiators has traditionally been "as high as possible". This has been based on obtaining a low radiation angle to facilitate long distance communication. Examination of the ground reflection diagrams in ARRL Antenna Book 3 — 8 confirms this view particularly for each half-wavelength (λ/2) above a perfectly conducting groundplane. At the odd quarter-wavelength (λ/4) of height, however, a substantial part of the applied power is radiated vertically, and the low angle lobes are reduced so that for radiators below λ/4 of height most of the power is directed between 60 degrees and vertical.

Another requirement for these theoretical ground reflection diagrams is that the near field area, up to five or ten wavelengths from the radiator, shall be clear of obstructions particularly metal conductors and sizeable buildings.

For most suburban and portable sites used for the longer wavelength HF transmissions these conditions of height and space are impossible. In the real world the ground reflector is anything but perfectly conducting. In fact it should be rightly regarded as a lossy dielectric.

This has been depicted in the "Radiation Resistance" diagrams 12.86 of *Radio Communication Handbook* (RSGB) as at diagram B where the actual resistance increases as the radiator approaches zero height. This increase indicates absorption of power as losses in that very imperfect dielectric reflector. Of course, a part of these losses also occurs for higher radiators so that the power reflected from ground never doubles the directly radiated power as with a perfectly conducting reflector.

Bill McLeod VK3MI conducting low radiator tests on an antenna only 40 cm above ground.

Examination of Table 1 of the "Effects of Earth" at Para 3 — 3 of the *ARRL Antenna Book* shows the dielectric constant for common types of earth varying from 3 to 20 with the average of 13, exceeding that of commonly used insulating materials and highly resistive compared to a metallic conductor. The high dielectric constant does improve the low angle reflections, however, in much the same manner as light reflected from thick glass.

For VHF and the higher HF transmission the installation height can usually be selected to suit requirements but for the lower HF bands and especially for portable stations amateurs are commonly restricted to a height of 10 metres or less. This is a bare λ/4 for the 40 metre band and only λ/8 for the 80 metre one. Then there are those restricted to even lower height limits or who wish to use concealed radiators.

Low Horizontal Radiators

(a) For low practical heights the radiation resistance at the centre of a resonant dipole remains within the 2/1 VSWR range for the usual coaxial cable feeder to the transmitter so matching procedures are minimal, more so when an electrical λ/2 of coaxial cable is used to transfer that resistance directly to the transmitter.

(b) Whereas the resonant length of a dipole remote from ground is mainly determined by the length to diameter ratio of the conductor, when the ground becomes an increasing part of the dielectric the length is determined by the height to diameter ratio. Due to the wide spread of dielectric constant no simple formula can determine this ratio.

(c) The loss increases as height decreases toward ground level but does not become prohibitive until very low levels are reached, eg for a 40 metre dipole above common clay this can be as low as λ/40 (1 metre).

(d) The "cone" of radiation directed vertically then reflected back from

the ionosphere can produce non-directional communication with no "skip distance" to some 400 to 500 kilometres from the transmitter. This is Near Vertical Incidence Skywave (NVIS) transmission and is the mode supporting those local nets on the eighty and forty metre bands. There is usually some fading but for single sideband reception the long AGC time constant of the receiver will alleviate this.

(e) Two or three hop transmission can occur where the intermediate reflection points fall at sea so some long distance is possible in these favoured directions without low angle transmission lobes. Land reflection points include greater losses which soon become excessive.

Test Results

A series of full scale tests on resonant dipoles for the 40 metre band resulted in some seasonal variability due to changes in earth conditions with the lowest radiation resistance varying from 32 to 45 ohms at resonance. This minimum occurs over a quite broad range of heights down to λ/20 (2 metres) before increasing sharply toward 100 ohms and more at a very low to surface level.

A representative curve is presented at diagram A for 1 mm diameter wire. The optimum wire size appears to be from 0.7 mm up to 2 mm. For thinner wire of 0.25 mm diameter the series resistance, including skin effect becomes an appreciable part (some 20%) of the radiation resistance and, for larger wire of 4 mm diameter, the greater capacity couples to the earth losses about one and a half times higher than for the thinner wire.

For a 50 ohm coaxial cable of an electrical λ/2 using solid polythene dielectric only 14.1 metres is required to transfer the combined radiation and loss resistance directly to the transmitter. Excess length over the physical distance should be coiled at a convenient place and NOT cut off!

The length formula for a resonant dipole, viz 492 (n — 0.05)/F MHz, is an approximation with the speed of propagation expressed in feet per second and a 5% deduction for length/diameter ratio of the wire, insulators and other end effects. This is for a 2 mm wire fairly remote from earth and considerable adjustment is required as parameters are changed, particularly the proximity to earth.

With metric measuring tapes, etc it has been found more convenient to express the length for each height as a percentage of the free space wavelength calculated as 300/F MHz for a result in metres.

The two λ/4 elements of the dipole are measured with a little excess and placed in position before the resonant frequency is determined. The error from the required frequency is calculated as a percentage and the required number of centimetres is removed from each end. That is, a 2% error in each 10 m leg of the dipole is corrected by removing 10 m by 2% = 20 cm from each end for a final length of 9.8 m + 9.8 m.

Accuracy of the order of 0.5% should be the target as after all 2% either way is close to the band edges from 7.15 MHz. A battery operated digital frequency meter is easily capable of the required accuracy rather than the dial reading of a

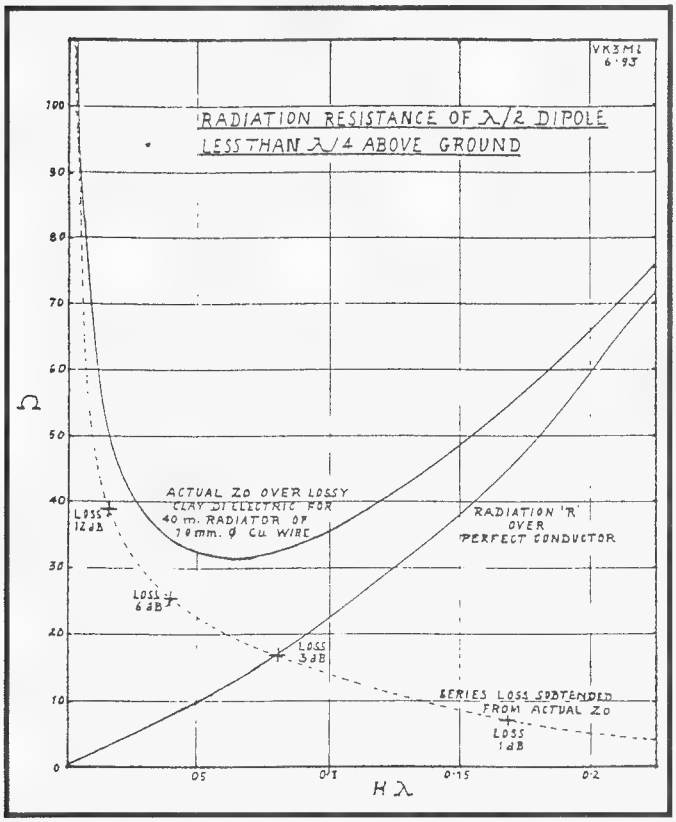

Diagram A — Radiation resistance of λ/2 dipole less than λ/4 above ground.

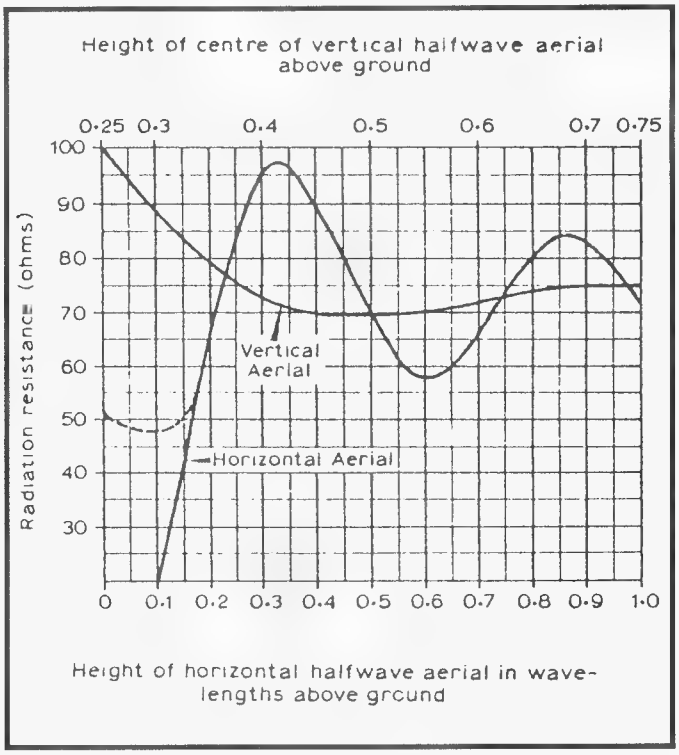

Diagram B — Radiation resistance of λ/2 horizontal and vertical dipoles as a function of height above a perfect earth. Dotted curve suggests likely behaviour of horizontal aerials over actual earth.

(Reprinted from Fig 12.86 in the RSGB Radio Communication Handbook.)

favourite dip oscillator to determine resonant frequency.

From Table 1 comparing radiation resistance and length (in terms of "Ef" for Earth Factor or Wind Effects) as a proportion of free space wavelength the reduction in length proceeds steadily until the capacity via the earth dielectric becomes the dominant factor along with the associated resistive loss at about λ/20 above the surface, then the length reduces rapidly.

That this effect is mainly capacitive affecting the voltage sensitive end 37% of the dipole is demonstrated at Table 2 where the same dipole with the centre height fixed at 1 m is compared as a saggy dipole with the ends raised to 2 m, and as a droopy dipole with the ends lowered to 5 cm off the surface. Included as comparisons are the level dipole at 2 m and also at 5 cm. These are commonly used shapes compared at a critical height above ground and are NOT to be confused with Vee or inverted V dipoles which imply an included angle less than 135 degrees. The characteristics approach those of a level dipole at the height of the ends and the saggy dipole is a very effective radiator for portable installation as it requires only two light poles or bamboo rods to support the ends at 2 to 4 m and a short post to take the weight of the centre connection and feeder cable.

The increased capacity end effect lowers the Q of the radiator resulting in a wider bandwidth, useful for transmitters sensitive to high VSWR. This should remain within the 2/1 range from 7.0 to 7.3 MHz for a low dipole resonated to mid-band and fed from the transmitter by λ/2 of 50 ohm coaxial cable.

With the radiator closer than 5 cm from the surface the dry to wet variations in the earth and inaccuracies in spacing preclude any consistent, meaningful results but the higher altitude tendencies are accentuated. Perhaps a perfectly flat bowling green, out of season, could be used for further tests!

Both Table 1 and Table 2 include the capacity measured between the two legs of the dipole which, of course, when distributed along the length has no direct relevance to the capacity actually tuning the dipole but does indicate a proportional increase along with the impedance and length effects. This also applies to the calculated Resonant Capacity shown in Table 2 which would resonate an inductance of 33 μH to the frequencies specified. Within the margin for error of practical measurement the proportion of these capacity changes is directly related to the frequency changes.

HORIZONTAL DIPOLE - 8m94 + 8m94 - Nominal 33 uH.

Shape	Height End-Centre-End	Freq. KHz.	Impedance Ohms	'E' factor %	Measured C=pF.
Level	2 - 2 - 2m	7765	31.5	92.5	38
Saggy	2 - 1 - 2m	7810	32	93	37
Level	1 - 1 - 1m	7705	35.5	91.75	39
Droopy	.05- 1 -.05m	6977	47	83	43
Level	.05-.05-.05m (50mm)	4710	116	56	110

Table 1 — Effects of shape, close to clay ground for dipole of 1 mm diameter PVC covered wire — hot, dry weather — green grass.

LEVEL HORIZONTAL DIPOLE - 8m94 + 8m94 - Nominal 33 uH.

Height	Freq.	Impedance	'E' factor	Measured C	Resonant C
2m0	7767 KHz.	31R5	92.5 %	38 pF.	12.5 pF.
1m5	7745	32R	92.3	37	=
1m	7727	35R5	92	38	=
0m5	7550	45	90	40	=
0m2	7135	61	83	46	15
0m1	6400	70	76	87	=
0m05 (50mm)	4710	116	56	110	35

Table 2 — Effects of height above clay ground for dipole of 1 mm diameter PVC insulated copper wire — hot, dry weather — green grass.

The impedance increase at very low heights related to ground losses is indicated in diagram A which is an extension of similar diagrams in the reference handbooks and an estimate of these losses compared to the theoretical radiation resistance above a metallic reflector has been included in that diagram also.

Low Dipole Conclusions

In general the resonant horizontal dipole is an effective radiator at very low height from ground particularly for NVIS transmission. Losses increase seriously below λ/30 and the high impedance ends of the elements should have at least this amount of separation from ground or metallic earthed objects, towers and poles (only 1.5 m for the 40 metre band).

Kevlar, Black Dacron, Polypropylene Baler Twine, and Nylon Rope are all suitable insulating supports with far less end effects than the single egg shaped strain insulator wired back to a steel tower which has been commonly used. Supports of this nature have been measured with 6 to 15 pF coupling to the earthed object and Table 2 can be used to estimate the end effects of this type of support.

With the elements double insulated inside the popular 12 mm polypropylene garden irrigation piping erected at 1.5 m on the post side of a suburban wooden fence a very effective concealed radiator should result.

For portable use a couple of 4 m bamboo poles for end supports and a saggy dipole radiator require no apology as to effectiveness for NVIS transmission but directivity, if any, depends on local obstructions and reflectors.

Safety Considerations for Low Radiators

Safety is an important consideration for both low radiators and for elevated ground planes. One part is physical in that any wires below 3 m can be regarded as a trap for man and beast including horses and wandering cattle. Even in daylight a thin wire can disappear against some backgrounds and at night is a very serious hazard. Therefore a protective, non-metallic hard rail or fence is necessary, not just a coloured streamer tied in the middle of the hazard.

The other aspect of safety is electrical as even at low power a nasty sting and RF burn can occur which, for non-technical people or for

climbing children, can produce an emotional reaction far in excess of the initial injury. At medium power, around 100 watts, these effects can become severe and for greater power the effects of corona and irradiation must also be considered. Therefore, the use of unprotected low installations is not recommended for higher power transmissions and even for low power use the radiator, or ground plane end sections, should be double insulated by enclosure in plastic pipe or conduit.

Increasingly important at longer wavelengths, thus longer radiators, there is static charge and induced voltage from lightning discharges in the neighbourhood. A 4.7 k resistor of 2 W rating across the centre connection of the dipole can alleviate some of the effect where the screen of the coax is directly earthed. Incidentally, this allows an ohmmeter check on the cable. RF transient protection devices may also be connected across the cable at the equipment end.

The Woolshed Reflector — A low dipole for DX

While the emphasis for low dipoles is on NVIS transmission for local use a suitable reflector for low angle propagation would allow long distance operation.

This reflector can be the double pitched metal roof of a building about 20 m long and some 6 to 8 m wide. With a low dipole 2 m above the ridge of a roof with the common one-in-two slope either side (25 to 30 degrees) radiation below 20 degrees above horizon is possible in the broadside directions.

A dipole for 40 metres arranged in this fashion using 1 mm PVC insulated wire has a resonant length some 95% of the free space wavelength and a radiation impedance of 12 ohms. This is considerably lower than over lossy earth and consistent with the theoretical value for a conductive earth plane.

However, matching arrangements to suit the usual 50 ohm cable at the junction with the dipole are required. Yagi type beams of similar impedance use the gamma match system but it is more suited to tubing construction rather than wire elements. In this case ferrite cored transformer type matching appears more appropriate. However, to achieve the necessary low impedance balanced output is difficult compared with the more common high impedance output for these transformers. This is especially so when the windings on their ferrite rod must fit inside the round 50 mm PVC conduit junction box used for weather protection.

The simpler but less popular matching arrangement is the L type network consisting of one capacitor and one inductor. This can be calculated honestly (RSGB Radio Communications Handbook 12-41) or by selecting the standard value of capacitor with reactance closest to the geometrical mean of the two impedances requiring to be matched. The square root of 12 x 50 in this case indicates 24.5 Ω, about one ohm below the calculated value. The nearest standard capacitor value of 820 pF runs to 27.3 Ω. This may be resonated to mid-band with a self supporting coil of 1 mm EC wire 10 mm in diameter by some 10 mm long. Include a 12 Ω load resistor in series while testing as this can cause a shift of 2% or so. Trim to a half-turn (say 9.5) then finally adjust by stretching slightly before binding with polypropylene adhesive tape (Bear 666P) to stabilise the coil mechanically. Those old fashioned mica capacitors with a voltage rating of several hundred are quite suitable for low power portable transmission up to 20 watts but at 100 watts the capacitor would require an RF current capability over 4 amps as well as high voltage peak rating. Connect the 12 Ω load to "see" the series LC circuit with the 50 Ω coaxial cable connected across the capacitor shunted by the coil and load.

No tune up adjustment is required after initial installation as the bandwidth of this network is much wider than the 40 metre dipole and the VSWR should be less than 2/1 across the band.

The Earth Plane

As noted earlier the earth should be regarded as an imperfect insulator and is only connected as a convenient common point for various types of circuitry. From the ARRL Antenna Book 3-3 the conductivity, over any single path, for average heavy clay can be 0.005 Siemens per metre (200 ohms) and this does not include the contact resistance of a practical connector to a large number of parallel points in this clay. Commercial earth mats and large buried objects can achieve very low contact resistance but many amateur stations rely on the reticulated water supply for about 3 ohms of contact resistance with metal pipes of galvanised steel or copper. One only is preferred to avoid galvanic action.

For portable radio operation an earth rod or pipe driven 50 cm or so will result in contact resistance from 20 to 100 ohms to ground. (Earth Rod Tests — *Amateur Radio* July 1986). This may not be much for the many thousand volts of a lightning strike to overcome but it can absorb much of the power available from a portable transceiver with a radiator in series with that earth rod.

The counterpoise or artificial earth was devised many years back to overcome difficult earthing situations

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and usually consists of various patterns of metallic conductors arranged on the surface. The simplest of these consists of two λ/4 sections of insulated wire arranged in a straight line similar to a dipole but connected in parallel to cancel any horizontal radiation from them.

However, from the data on low radiators, it is apparent that the length of these sections must be adjusted to almost half of the free space wavelength to resonate with the capacity induced by the adjacent earth with the high dielectric constant. They can best be tuned to a particular frequency by connecting in series with a coupling loop to use a Dip Oscillator.

The loss due to the adjacent earth will, of course, be similar to the dipole (100 ohms and more) when driven in series as a dipole but when connected in parallel against a vertical radiator the loss for the counterpoise can be expected to fall to a quarter of the dipole figure. This loss may be reduced by adding more pairs in parallel and some 32 or more of these radials have been recommended but this solution approaches the large earth mat associated with a base station rather than a portable situation.

The High Earth Plane

Another solution to the earth loss problem is to separate the artificial earth from the surface. This results in longer λ/4 sections but the losses can be considerably reduced. Once again deriving from the low dipole data of around 50 Ω impedance at a height of λ/40 then two paralleled λ/4 sections should add only 12.5 ohms to the 20 ohms or so of radiation resistance attributed to the associated vertical radiator. This combination presented to the feedline is a fairly acceptable figure for this Marconi style radiator system and implies a loss of less than 2 dB.

This height is about 1 m for the 7 MHz band and is therefore a man trap unless protected physically and electrically. Yes, electrically, as after all it is the other half of a radiating system even if known as an artificial earth. Protection as for a low dipole is recommended, eg a non metallic fence and the outer ends double insulated in polypropylene tubing of the garden irrigation variety.

The Practical High Ground Plane

Several inverted L type radiators have been tried on the 7 MHz band with the twin λ/4 counterpoise at various heights. They were compared with the same radiator element against a deep driven (2 m) earth rod in a damp location.

With the counterpoise above 50 cm from the surface the effectiveness was judged better than the direct earth connection. Further evaluation is required at a number of locations free of power line interference and scattering due to local buildings.

Only small changes occurred with changed configurations with the two halves still diametrically opposed and the end height equivalent to the level counterpoise. A middle dip shape with the centre connection taken down at 45 degrees to the surface or a saggy shape with a gradual slope down to the centre from the elevated ends are both satisfactory when tuned in position and are convenient for use with a ground mounted, self supporting radiator.

However, a drooping shape sloping down from the elevated centre to the surface at both ends is little better than the whole length on the surface, ie earth losses are effectively coupled into the ends.

If a proportion of horizontally polarised radiation is required then only one half of the twin quarter wavelength (λ/4) can be allowed to radiate along with the vertical radiator. The separation from earth will need to be increased to keep losses low, however. This combination is a vertical quadrant when remote from the surface but, with a low horizontal section, becomes the popular vehicle radiator with a helical whip mounted on the front or rear.

The Vehicle Radiator

The tuning of the HF vertical whip differs from vehicle to vehicle, not because of variations in the whip itself but because of changes in the counterpoise, in this case the body of the vehicle.

Two small to medium size passenger cars of the same type and some 4.25 m long over the metalwork can be expected to resonate as a dipole in the region of 8 MHz when nose to nose. The resonant dip is rather indeterminate at 1.5 to 2 MHz wide indicating a very low Q due to the large capacitance and the ground losses involved in this very low dipole. To achieve balance for either vehicle against a vertical whip for 7.1 MHz requires additional inductance on the earthy side of the whip mounting, NOT a longer whip. The alternative is a longer car!

Larger cross section and length probably accounts for the effectiveness of long distance buses and trucks as mobiles in the 4-5 MHz band and longer semi trailers at even lower frequencies except when the prime mover is separated from its trailer. The vehicle body provides the horizontal radiation for NVIS communication in the local area notwithstanding the high losses while the vertical whip provides the low angle capability beyond the first 300 kilometres.

Conclusions

The low radiator and the elevated ground plane are very practical parts of radiating systems for the lower HF bands when used within their limitations, particularly for portable use. The characteristic data given in diagram A and Tables 1 & 2 for the 40 metre band are intended to provide the initial information for further development. Extrapolation to the 80 metre, or even 160 metre, bands should be a straight forward scaling up operation.

Emergency operation after storm damage to fixed site installations can also be expedited using these characteristics and estimates.

The general concept may be extended from the basic dipole to other types of resonant radiating systems in close proximity to earth, including mobile vehicle radiators.

*42 Capon Street, Chadstone, VIC 3148

ar

Prevent Pirates — make sure you sell your transmitter to a licensed amateur.

■ Regulations

SMA's New Policy on Handling Interference From Transmitters

The Spectrum Management Agency (SMA) has changed the way in which it handles interference to radio and television reception arising from the operation of amateur transmitters.

The new policy, which has been developed in consultation with the Wireless Institute of Australia, encourages amateurs to become more involved in resolving interference arising from the operation of their station.

Interference involving amateur transmitters mainly occurs because of two factors; a lack of radiofrequency immunity in the affected broadcasting receiver and the close proximity of the amateur transmitter. Under earlier radiocommunications legislation, the SMA's approach to the handling of these interference problems resulted in the responsibility for remedying such problems generally falling to the owner of the affected device.

Under the Radiocommunications Act 1992, interference is defined to include interference to broadcast reception, whether resulting from an immunity problem in the affected receiver or from any emission of the transmitter. The new approach stems from this definition and the basic legislative requirement for all transmitters not to cause substantial interference.

As part of the SMA's wider approach to the management of interference, television and radio receiving equipment standards are planned to be upgraded to improve their resistance to interference.

In addition, in recognition of the roles that broadcasting reception and amateur radio play in the community, the SMA has introduced a policy that provides a more balanced approach to the resolution of interference problems involving the operation of amateur transmitters.

The policy places a joint onus on both the affected party and the transmitter operator to work together to resolve such problems. The SMA has detailed measures that can be employed at the television or radio receiver and the transmitter installation to minimise interference. For example, televisions should be fitted with an external antenna and it will often also be necessary for an appropriate filter to be fitted at the affected receiver. Amateurs should use good engineering practices when installing their station and should always communicate using minimum transmitter power.

Almost all interference problems can be resolved without the intervention of the SMA, provided that both parties co-operate with each other and follow the suggested measures.

Information on resolving transmitter interference has been produced in a brochure entitled *Better television and radio reception: Interference from CB and Amateur Transmitters.* The brochure is in two parts. The first part, which provides helpful information about resolving interference for both the person affected by interference and the transmitter operator, should be read in conjunction with the booklet *Better television and radio reception: Your self help guide.* The second part of the brochure is the policy statement which outlines how the SMA handles unresolved interference. This latter section will usually only apply to the very few cases where interference cannot be resolved by the parties concerned.

Both of these publications are available from any SMA office free of charge.

Members of the public may obtain further advice on interference matters, free of charge, by contacting any of the SMA's offices. Where the SMA is called upon to provide a diagnosis of actual interference problems, a fee for service will apply.

Where it is necessary for the SMA to investigate instances of unresolved interference, the SMA will consider, on a case by case basis, a range of factors including what measures have been adopted by both parties to resolve the interference. Additionally, the SMA will consider whether further steps could be taken by the parties concerned to resolve the problem.

In practice it may not be possible to resolve interference problems where appropriate measures, such as the use of an outside antenna for television receivers, have not been taken by the affected party.

Where reasonable measures have not been taken by an operator to overcome interference involving his or her transmitter or where substantial interference remains after all practicable measures have been taken, it may be necessary to restrict the operation of the transmitter.

The SMA's new interference policy also applies to television and radio interference involving the operation of CB transmitters.

The SMA's *Better television and radio reception: Interference from CB and Amateur Transmitters* brochure is reproduced here for the information of readers.

Resolving Interference to Television and Radio Reception from the operation of Citizens Band or Amateur Transmitters

Section 1 Resolving interference

1.0 Why does interference occur?
2.0 Identifying the interference
3.0 What can be done to resolve interference?
3.1 Things that can be done at the television receiver
3.2 Things that can be done at the radio receiver
3.3 Things that can be done at the transmitter installation

4.0 SMA assistance in resolving interference
5.0 Further information on interference resolution

Section 2 SMA Policy Statement
6.0 Purpose
7 0 Background
8.0 Legislative considerations
9.0 Substantial interference
10.0 Policy objectives
11.0 Strategies adopted by SMA to achieve policy objectives
12.0 Possible outcomes of unresolved interference

Section 1 — Resolving Interference

This information brochure aims to assist both the person affected by the operation of a nearby CB or amateur transmitter and the transmitter operator to resolve television and radio interference problems.

This brochure should be read in conjunction with the *Better television and radio reception: Your self help guide* booklet available free of charge from the Spectrum Management Agency (SMA). This booklet is referred to as the "Better television and radio reception" booklet elsewhere in this brochure.

1.0 Why does interference occur?

Interference to television and radio reception can arise from the operation of many electrical and electronic devices. Interference can be caused by electric motors, thermostats and light dimmers; high voltage electricity powerlines; and transmitters such as those used by CB and amateur operators.

Interference from devices such as electric motors, light dimmers and electricity power lines result from the generation of radio frequency signals by these devices. These interfering signals are essentially radiated on a wide range of frequencies including the frequency of the wanted station.

Interference from CB and amateur transmitters however generally occurs because the radio and television receiving equipment, including video cassette recorders (VCR), is unable to reject the unwanted CB or amateur transmissions which are on different frequency bands from those used by radio and television stations. This is a problem known as a lack of radio frequency immunity. Some interference can also occur because of faults in the affected receiving equipment or antenna installation.

The close proximity of the affected receiver and the CB or amateur transmitter also contributes to these problems.

2.0 Identifying the interference

After it has been determined that television or radio reception is unsatisfactory, it is necessary to identify whether the poor reception results from interference or other factors such as the use of an inappropriate receiving antenna.

Where interference is reasonably suspected, it then becomes important to correctly identify the source of the problem. Fortunately, the characteristics of interference from the various sources are sufficiently different to make identification relatively easy.

The "Better television and radio reception" booklet describes with illustrations the various interference problems and the remedies that may be employed to resolve them. The techniques used for resolving interference depend on what is causing the interference. Interference problems involving CB and amateur transmitters are covered by the booklet in the section dealing with "radiocommunication transmitter interference". The illustrations shown in the booklet in the "Radiocommunications transmitter interference", "AM broadcast transmitter interference" and "FM broadcast transmitter interference" sections indicate the differences between good quality television reception and reception marred by substantial interference.

If it is considered that a CB or amateur transmitter is involved in the interference, the operator concerned should be contacted to assist in conducting tests to confirm the nature of the source.

3.0 What can be done to resolve the interference?

The level of interference observed or heard on a broadcasting receiver is dependent, amongst other things, on the difference between the level of wanted signal and the level of interference. The wanted signal can be improved by having an appropriate external receiving antenna while the interfering signal can be reduced by filters. The connection of an external receiving antenna is the first step towards resolving any interference problem.

Once an antenna has been installed, any interference that remains from the operation of electrical appliances requires the use of suppression devices at the appliance itself. Suppression of appliances is normally best left to professional electricians. Interference from overhead electricity powerlines results from leakage currents across dirty or broken insulators arcing to earth and should be reported to the Electricity Supply Authorities for resolution.

Interference involving CB and amateur transmitters, in most cases, can be eliminated by the use of an appropriate receiving antenna installation and the fitting of suitable filtering devices to the affected equipment. Transmitter operators additionally need to ensure that the transmitter and its antenna have been properly installed.

Providing maximum separation of the television/radio antenna and the transmitter antenna also minimises the level of CB or amateur signals and, consequently, the level of interference.

While many instances of this type of interference can be resolved by the affected person alone by reference to the "Better television and radio reception" booklet, it is often necessary to involve the CB or amateur operator as some remedial measures may be required at the transmitter.

The location of CB or amateur stations can usually be ascertained by their large antennas. CB or amateur operators can often assist in the correct identification of the particular interference and, where required, the choice of an appropriate filter.

3.1 Things that can be done at the television receiver

Interference may be eliminated or minimised by:

- ensuring that the standard of the receiving installation provides adequate reception in the area. This includes the use of a correctly

installed and maintained external antenna and appropriate antenna cabling;

- ensuring that masthead and distribution amplifiers, where used, are fitted with filters designed to minimise interference;

The "Better television and radio reception" booklet provides information on the checks you can make on your equipment and also shows the effects of an inadequate signal. A weak television signal is prone to interference even from low level sources;

- locating the external television antenna as far away as possible from the antenna of the CB or amateur transmitter; and
- the fitting of appropriate interference filtering devices to the affected equipment. While most interference is resolved by fitting filters in the cable run between the antenna and the television receiver, it is sometimes necessary to fit filters in the electricity mains lead. Use only filters approved by Electricity Authorities. The booklet provides advice on particular measures that can be employed to resolve the various types of interference.

The operator of the CB or amateur station involved can provide advice about their frequencies of operation and this will assist in the choice of an appropriate filter.

3.2 Things that can be done at the radio receiver

Interference may be eliminated or minimised by:

- ensuring that the standard of the external antenna is sufficient to provide adequate reception for the area;

Some television antennas are able to be used for the reception of FM radio by fitting a "two way splitter". More information on this matter may be found in the booklet.

- locating the external antenna as far away as possible from the antenna of the CB or amateur transmitter.

The use of radio receivers with internal ferrite rod antennas will not always provide a sufficient wanted signal level for interference free reception. These receivers should, in any case, be positioned to receive maximum signals.

3.3 Things that can be done at the transmitter installation

Operators whose transmitters are involved in an interference problem should participate with persons affected by the interference in the resolution of the problem.

Operators of CB or amateur transmitters can minimise the potential for interference by:

- ensuring that good engineering practices are followed in the establishment of their transmitter and antenna;
- selecting and locating transmitting antennas for interference minimisation;
- properly matching the transmitter to the antenna;
- employing additional radio frequency filters appropriate for the frequencies of operation;
- utilising a separate radio frequency earth connection.

Operators of amateur transmitters can further minimise the possibility of interference by:

- reducing the transmitter's output power; and
- selecting a frequency of operation compatible with broadcasting stations in the area.

Where interference is known to be caused, the operator may consider:

- using their transmitters at locations not in the near vicinity of television or radio receivers; or
- using their transmitters other than during prime viewing or listening times.

4.0 SMA assistance in resolving interference

The SMA provides a range of services to assist with the resolution of interference problems.

- The "Better television and radio reception" booklet is available from all SMA offices free of charge. Technical information concerning the installation of television aerials is also available free of charge.
- Additional assistance with individual problems may be

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obtained by telephoning the nearest SMA office.

- An interference diagnostic service is available to persons affected by the interference or the transmitter operator concerned. This service involves a visit by the SMA. Affected viewers and listeners may apply for this service by completing the questionnaire that accompanies the "Better television and radio reception" booklet and send it to the SMA office closest to them. The SMA will contact the applicant to discuss the problem before arranging a visit. If the SMA visits to investigate an interference, it will provide advice on measures that will eliminate or minimise the interference. SMA visits are conducted in normal business hours, ie Monday to Friday except for public holidays.

Where a visit is made to investigate the cause of interference a prescribed charge is applicable. The SMA will invoice the applicant after completion of the investigation.

A television and radio technician should also be able to diagnose these problems and install appropriate filter devices to remedy the interference.

5.0 Further Information on Interference Resolution

It is important to recognise that radio and television interference involving CB and amateur transmitters is a shared problem for both the person affected by the interference and the transmitter operator.

In most cases, interference can be resolved by appropriate use of radiofrequency filters at the affected receiver and the use of appropriate and technically sound transmitter installations by the CB or amateur operator.

Where the interference is not resolved by the parties concerned, the following policy statement indicates the factors that are taken into account by the SMA when handling interference matters arising from the operation of CB and amateur transmitters.

Spectrum Management Agency Policy Statement

Resolution of Interference to Television and Radio Reception involving the operation of Citizens Band and Amateur Transmitters

Section 2 — Policy Statement

6.0 Purpose

This statement sets out the policy of the Spectrum Management Agency (SMA) in regard to the resolution of interference to television and radio reception from the operation of Citizens Band Radio Service (CB) and amateur transmitters.

7.0 Background

A feature of domestic environments is the widespread use of radiocommunications equipment such as television and radio and, under regulation, non-broadcasting transmitters including those used for the CB and the Amateur Service.

Regional broadcasting transmitters and translators have reduced many of the reception difficulties experienced in the past but the use and enjoyment derived from television and radio equipment is still sometimes marred by interference, of one form or another from other electronic equipment.

Interference to television and radio receivers often arises from the operation of nearby CB and amateur transmitters. Some interference can occur due to the inability of the affected equipment to adequately reject the CB or amateur transmissions. This inability is usually referred to as a lack of radio frequency immunity. Interference can also arise from the close proximity between the transmitter and the affected equipment as well as from faults in the transmitter.

Equipment standards, specifications and licensing conditions are intended to ensure that CB and amateur transmitters meet stringent quality requirements. By contrast, radio and television receivers vary in quality and many do not have a high level of immunity.

The policy covered in this paper, which is based on the above considerations, has been developed in consultation with representatives of consumer organisations and the CB and amateur communities.

8.0 Legislative considerations

This policy supports provisions of the *Radiocommunications Act 1992* (as amended) where:

Interference in relation to radiocommunications is defined as: "interference to, or with, radiocommunications that is attributable, whether wholly or partly and whether directly or indirectly, to an emission of electromagnetic energy by a device"

and "device" is defined as:

"(a) a radiocommunications transmitter; or

(b) any other transmitter; or

WIA News

Intruder Watchers Needed

This is a reminder that we need vigilance to protect our bands from the encroachment of stations who have no right to put signals in our exclusively allocated frequencies.

Would you like to help watch for, or monitor, intruders on our bands? Intruder watch reports *have* been successful in getting intruders removed. For example, reports from volunteer observers of the *Radio Society of Great Britain's* Intruder Watch were instrumental in having an interfering harmonic from Radio Rusii, a shortwave broadcaster located near Moscow, removed from the 20 m band last year. (See *WIA News* in *Amateur Radio*, March 1994 issue).

The Federal Intruder Watch Coordinator, Gordon Loveday VK4KAL, is seeking more volunteers to help monitor the HF bands. In particular, Divisional Intruder Watch Coordinators are needed in VK2 and VK3.

But how do you recognise an intruder? Well, Gordon has a very instructive tape on the subject, packed with real-life examples. If you're interested in helping out, write to Gordon and enclose a blank C60 audio cassette. Write to A G Loveday, Freepost No 4, Rubyvale QLD 4702.

(c) a radiocommunications receiver; or
(d) any other thing any use or function of which is capable of being interfered with by radio emission."

The Radiocommunications Act (s197) also makes provision that:
"A person must not knowingly or recklessly do any act or thing likely to:
(a) interfere substantially with radiocommunications; or (b) otherwise substantially disrupt or disturb radiocommunications."

9.0 Substantial interference

The SMA interprets substantial interference as that level of interference that degrades television and radio reception, under normal conditions, by a considerable degree.

10.0 Policy objectives

The objectives of this policy are to:
(a) promote an understanding of the causes, resolution and avoidance of interference involving the operation of CB and amateur transmitters;
(b) promote the principles of self-help in the joint resolution or minimisation of the effects of interference; and
(c) describe further processes for dealing with unresolved interference.

11.0 Strategies adopted by the SMA to achieve policy objectives

The strategies employed by the SMA to achieve the above objectives are:

- to distribute on request, free of charge, the SMA booklet *Better television and radio reception: Your self-help guide* to persons affected by interference or to those causing interference. Technical literature related to television receiver installation is also available free of charge;
- to encourage operators of CB or amateur equipment and persons suffering interference to their television and radio services to resolve the problem by mutual agreement and assistance;
- to provide a telephone advisory service for persons who require additional information or who want to discuss their interference problems with an SMA officer;
- to provide a diagnostic service to the affected party or transmitter operator during normal business hours based on a standard fee;
- to promote greater awareness in the service industry of the mechanisms, resolution and avoidance of interference involving the operation of these transmitters by encouraging the inclusion of related subjects in study courses; and
- the development of an Electromagnetic Compatibility (EMC) framework including standards for domestic equipment, particularly in relation to immunity to interference.

In dealing with unresolved interference, the SMA takes account of factors including:

For the television viewer, radio listener and transmitter operator

- whether self help principles have been used to attempt to resolve interference;
- the degree of participation by both affected party and transmitter operator involved in investigating and negotiations aimed at permanently resolving or minimising the affects of the interference;

For the television viewer

- whether the standard of the receiving installation is sufficient to provide adequate reception in the area;
- whether, where employed, additional amplifying devices are adequately filtered;
- whether the location of the external antenna is consistent with minimisation of interference;
- whether the location of the transmitter involved in the interference can be determined;

For the radio listener

- whether the standard of the receiving installation is sufficient to provide adequate reception in the area;
- whether, where appropriate, the location of the external antenna is consistent with minimisation of interference;
- whether the location of the transmitter involved in the interference can be determined;

For the transmitter operator

- whether good installation practices have been followed;
- whether the location of the transmitting antenna is, within practical constraints, consistent with minimisation of interference;
- whether the use of filters would reduce the interference;
- whether, in the case of an amateur transmitter, the output power of the transmitter could be reduced to resolve the interference;
- whether, in the case of an amateur transmitter, the frequency of operation could be changed to resolve the interference;

Other factors

- whether additional measures, such as the use of filters at the affected receiver, could be employed to resolve the interference;
- the level of affected television and radio signals;
  the level of unresolved interference;
- whether mediation by the SMA will effect a resolution of the interference;
- whether a referral to a Conciliator is appropriate; and
- whether regulatory action is necessary to prevent substantial interference.

12.0 Possible outcome of unresolved interference

For the affected party:

If the person affected by the interference has not applied relevant measures in an attempt to resolve the interference, the SMA may decide to take no further action to resolve the interference.

For the transmitter operator:

If the transmitter operator has not applied relevant measures in an attempt to resolve the interference, the SMA may decide to restrict the operation of the transmitter or take regulatory action pursuant to the Radiocommunications Act. **ar**

Tell the advertiser you saw it in the WIA Amateur Radio Magazine.

■ Technical

Technical Abstracts

Gil Sones VK3AUI

Overvoltage Protection

In *Technical Abstracts* in September 1994 an overvoltage protection circuit from QST June 1994 was featured. This used an Earth Leakage Circuit Breaker as the tripping device.

I have received a letter from Paul Howarth VK2ZPS who makes some suggestions for use locally. Paul also suggests a modification which allows use with a field day alternator which has a floating output.

Here is Paul's letter:

I read with interest the article about the overvoltage protection circuit by WB8IOW and would like to point out a problem with this circuit for use in Australia for 240 VAC installations.

You are right in that the Ground Fault Interrupter is known locally as an earth leakage circuit breaker or isolator. The most common type available is for use in domestic installations with an earth leakage sensitivity of 30 mA. It is commonly known as a safety switch.

The standard requires the earth leakage circuit breaker must trip with an earth leakage current between 50% and 100% of the nominated sensitivity. Mostly this is approximately 75% which is 22.5 mA for a 30 mA device.

The earth leakage circuit breaker uses a toroidal transformer to detect earth leakage current.

In the circuit described by WB8IOW a 12 kΩ resistor is used from a 120 VAC supply. This gives an earth leakage current of only 10 mA. While 10 mA earth leakage circuit breakers are available in Australia they are generally only used in cardiac areas of hospitals and are more expensive than the domestic version.

For a 240 VAC installation with a 30 mA sensitivity the resistance value should be 6.8 kΩ.

The earth leakage circuit breaker is a residual current device (RCD) which uses a toroidal transformer to detect earth leakage current.

The primary windings of the transformer are the current carrying conductors. These are the Active (Hot) and Neutral conductors. A secondary winding detects any residual current from the vector sum of the two currents. Normally this is zero unless current flow bypasses the toroid transformer. Usually this is via the earth. To trip the circuit breaker it is not necessary to use the earth or to ensure the alternator output is earthed.

The 6.8 kΩ resistor should be connected to the active conductor on the line side and to the neutral conductor on the load side of the earth leakage circuit breaker via the triac U2. See Fig 1.

Neutral to earth connection is not necessary in the circuit of Fig 1 to trip the circuit breaker on an overvoltage. However, the circuit breaker will not trip on an earth fault. This should not be a problem as any fault to earth would not result in any current flow and therefore present no danger to the operator. The only problem occurs if a second fault happens before the first fault is repaired. Then a fatal situation may result.

Merlin Gerin has a range of earth leakage circuit breakers called DPN Vigi in 10 amp, 16 amp and 20 amp

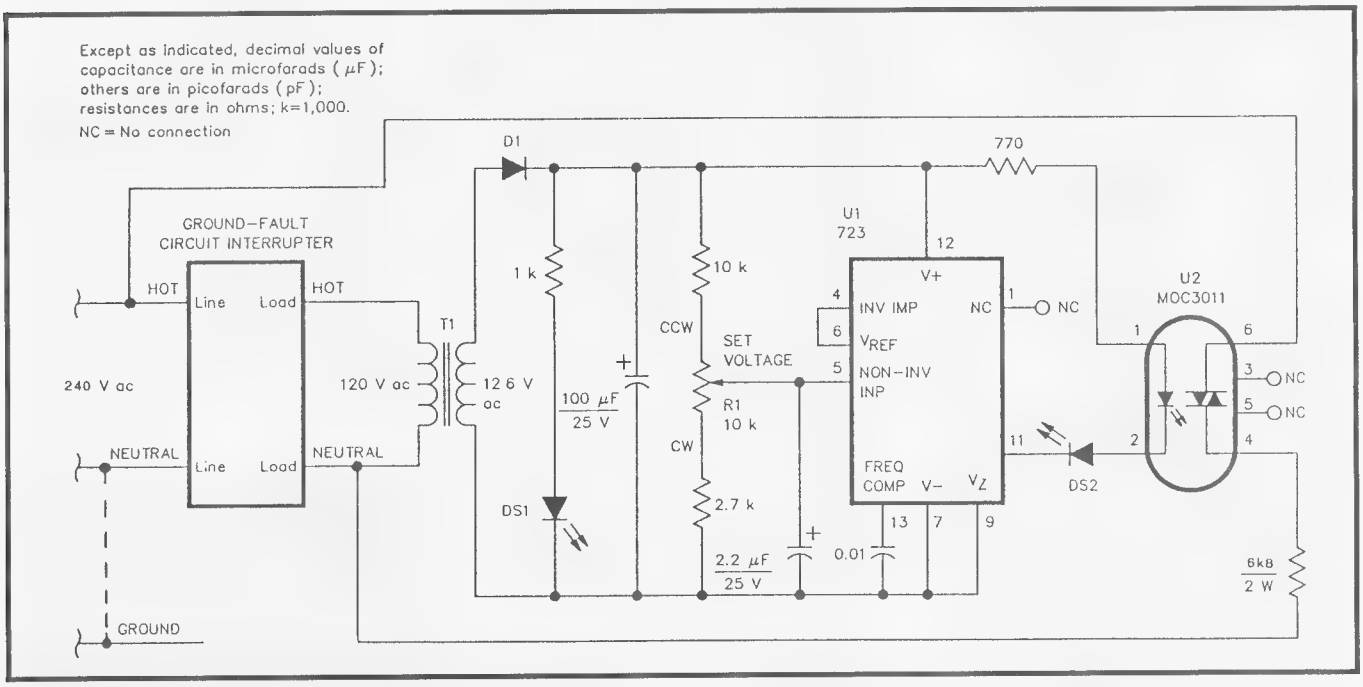

Fig 1 — Modified Overvoltage Protection Circuit.

current ratings with 30 mA earth leakage sensitivities for personnel protection. These are available from electrical wholesalers Lawrence and Hansen or Auslec.

Novel VHF Power Amplifier

At the CW and FM power limit one of the solid state brick amplifiers is simple to use. However, to run the legal limit on SSB a valve may well be attractive.

In *CQ*, July 1994 Bill Orr W6SAI describes a "Sheet Metal Special" which uses a 3CX800A7 grounded grid high mu ceramic triode. The original design was aimed at the FM broadcast transmitter market. The valve is expensive but may prove more economical than the second set of solid state fuses.

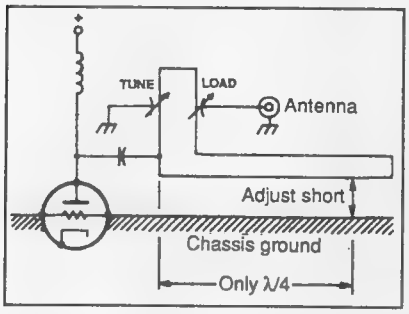

Fig 2 — Amplifier Plate Circuit. The plate end of the line is bent at right angles to the line to provide sufficient space for the tuning and loading flipper capacitors.

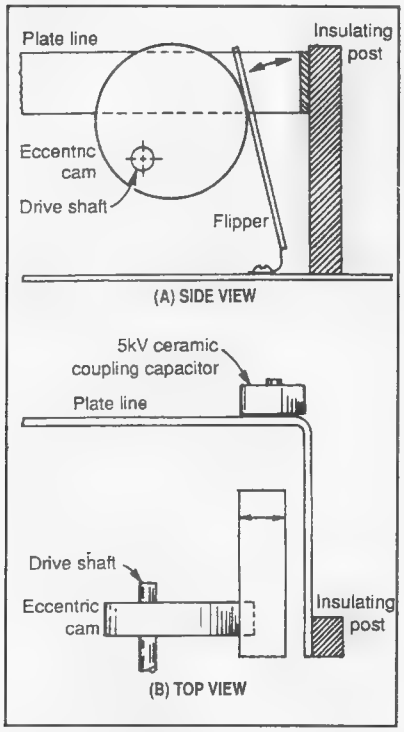

Fig 3 — (a) Side view of plate tuning flipper showing eccentric cam which presses against the hinged flipper plate. Assembly is panel driven through a vernier drive.
(b) Top view of plate assembly showing placement of main components.

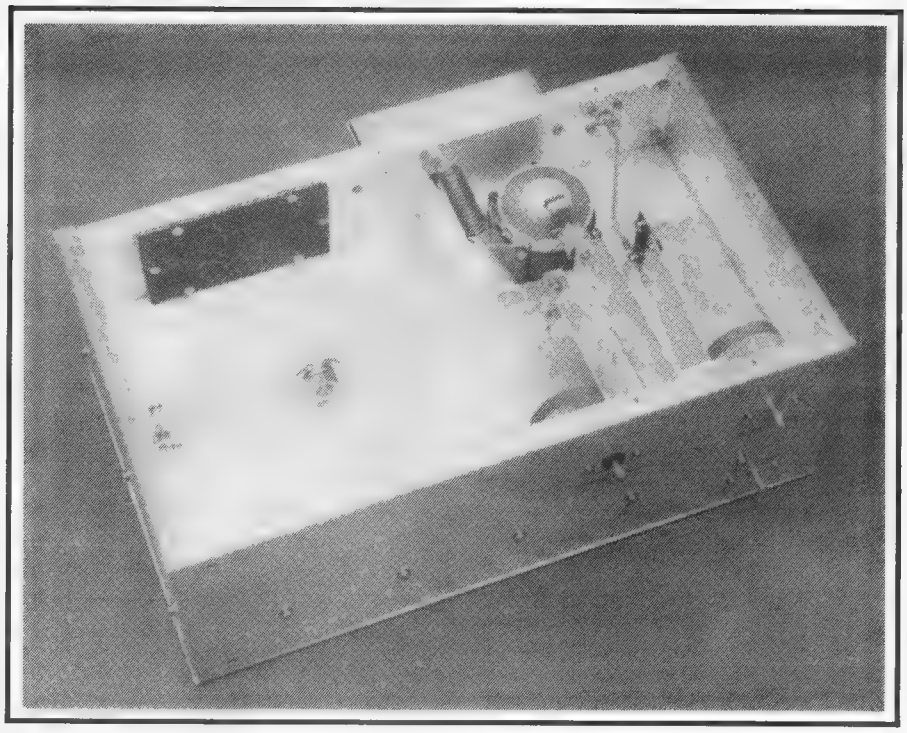

Photo 1 — Oblique view of amplifier plate assembly. The 3CX800A7 and socket are mounted directly in front of the small box covering the high voltage feedthrough capacitor. Adjacent to the valve is the air wound RF choke. The air intake is on the rear wall directly behind the stripline. At the plate end of the line are the tuning and loading flippers which move back and forth to a section of the plate line. This section is bent at right angles to the main line. The two eccentric drive cams are visible behind the front panel. A heavy shorting strap is positioned along the plate line to establish resonance.

The circuit uses an inexpensive plate circuit arrangement. Basically this is a shunt fed quarter wave strip line. Capacitive coupling is used to the antenna and both anode tuning and the coupling capacitors are flipper capacitors driven by eccentric cams of insulating material. See Fig 2 and Fig 3 and Photo 1.

Coarse anode tuning is by a movable short. The main anode strip line is mounted on edge 20 mm above a matching angle attached to the chassis. A movable short, which is virtually a nut and bolt, is used to vary the length of the line for coarse tuning.

The plate line is shunt fed with an RF choke and a high voltage ceramic capacitor. The end of the line at the valve end is bent at right angles and forms the fixed plate of the tuning and output coupling capacitors. See Fig 3(b).

The output coupling and the anode tuning capacitors are hinged flipper panels driven by eccentric cams of insulating material. These are, in turn, operated by reduction dial drives. The hinges are pieces of phosphor bronze. See Fig 3(a).

A 3CX800A7 needs 2 kV at 500 mA. For 25 watts drive, around 750 watts is possible. This should provide 400 watts with an adequate margin for SSB on 144 MHz.

The amplifier will need an air supply entering the anode compartment via a honeycomb RF filter and being exhausted through the valve anode cooler and the air system socket into the input compartment.

The proper sockets are essential for these valves together with an air source capable of providing the required air flow against the back pressure. The valves are listed in the Daycom catalogue.

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As the conventions occur in the warmer months, watch out for our latest equipment during this coming convention season. We will endeavour to offer several good specials to our participating dealers.

A call to 23 cm Users.
Those interested in 23 cm should remember we have a mobile unit available, as well as the unique triband handheld (IC-Delta 1A).

Stolen Register.
Our Service Department logs all stolen Icom equipment.
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ALARA

*Christine Taylor VK5CTY**

(l to r) Austine VK3YL, Christine WB2YBA, Valda VK3DVT. The photograph was taken in Valda's home by Marlene VK3EQO.

ALARA was saddened recently when Austine VK3YL became a Silent Key. Austine was recognised by ALARA, last year, for having held her licence for over 50 years. Austine was fortunately able to spend one afternoon earlier this year at the home of Valda VK3DVT, during the time that Christine WB2YBA was in Melbourne, as the photograph shows. Austine will be missed by all those who knew her over the years. Our sympathy is extended to her family.

On a happier note, ALARA was able to come to the assistance of a visitor from ZL recently. Dave ZL1AMN, who so capably runs the 222 YL Nets on Mondays, mentioned that June ZL2WE, a white stick operator from New Zealand, was in Melbourne to collect her Guide Dog, and was feeling lonely. Gwen VK3DYL got in touch with June and was able to lend her a two metre handheld for the duration of her stay.

In Perth, Poppy VK6YF has been providing support and accommodation for Bev VK6DE while Bev's OM Brian VK6AI had a bypass operation (he is doing well). Poppy also had the pleasure of spending some time with Marlene VK3WQ and her OM Jim VK3DL when they were in Perth on their caravanning way around Australia. Don't forget to put out some calls on 2 metres when YOU are visiting. People like to be able to extend a welcome, but they can't unless they know you are there.

Remember the ALARA Contest on 12 and 13 November

November is the month of the ALARA Contest when we hope everyone will try to participate, even for just a short time. The complete rules are elsewhere in this month's *Amateur Radio*. These have all the details of frequencies and the way to call and how each type of contact is scored. Don't forget to send in your log!!

It is a friendly contest. We have time to chat a bit and, although it is a YL contest, we are very pleased to have OM contacts. There are several OMs who regularly participate, and that's great. If you are an OM and have never joined us before, maybe this is the year! Please do!

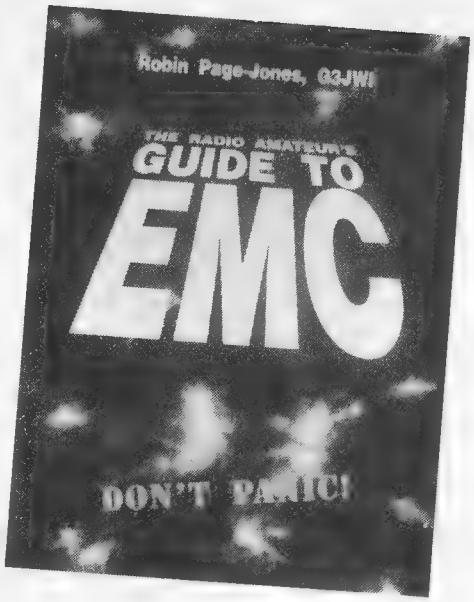
ALARA is just another way of encouraging an interest in amateur radio. The youngest-at-joining member was 12 and the oldest-at-joining was 80, so there is a wide range of ages. We have members who do not hold a licence and we have nearly as many overseas members as we have Australian members so, inevitably, our interests are very varied, too. See you all in the Contest.

*16 Fairmont Avenue, Black Forest SA 5035

Book Review

The Radio Amateur's Guide to EMC

Author: Robin Page-Jones G3JWI
Published by The Radio Society of Great Britain
Reviewed by Gil Sones VK3AUI



The cover of this book reminded me of "The Hitchhikers Guide to the Galaxy" with "Don't Panic" on the cover. Confronting EMC problems is a bit like an encounter with a Vogon. This book is not an addition to Douglas Adams' trilogy. It is, however, a very comprehensive guide to the EMC jungle and "Don't Panic" is good advice.

EMC is a growth area with an ever growing list of devices to be interfered with or, alternatively, to spew out interference. This book takes you through a very wide range of problems together with the reasons and suggested cures.

There are some differences between our situation and that in the UK. The TV in the UK is on UHF and the AC power mains use a slightly different setup to that used here. These differences are not enough to cause a problem, however, but must be recognised. Mention is made of VHF TV and the possible problems. Some filters are for UHF. The differences are no more than exist between Australia and the USA or any other country.

Tracing EMC problems is covered in some detail and a variety of cures is offered. Not only is the other equipment dealt with but also the people problems of interference which are often far greater than the technical problems.

Setting up amateur stations to minimise EMC problems is covered and many of the ideas are easy to implement and may save a lot of trouble. The Z match, which we all know, gets the nod as an EMC friendly ATU.

This is a book which you should read. It will help you avoid the pitfalls and prepare you for the day EMC comes to your door. It is packed with commonsense ideas on dealing with EMC and is a valuable backstop when you have to deal with EMC.

Allowing for the small differences between the UK and Australia this is a most valuable book to have on hand. You should read it so that you are prepared to deal with the problem and "Don't Panic".

This book is available for $25.00 from some WIA Divisional Bookshops as well as from Daycom Communications Pty Ltd, who submitted the book for review. **ar**

SOME THINGS HAVE NO COMPARISON

amateur radio action

The magazine for the serious radio operator

AT YOUR NEWSAGENT EVERY MONTH

THE 21st CENTURY COMM. RECEIVER IS HERE TODAY

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SoftWave is the first fully integrated digital communications receiver for Microsoft Windows. **SoftWave** combines a high performance receiver, digital signal processor, spectrum analyzer, database and Windows program in one product. It opens the door to wireless communications on the PC.

GENERAL FEATURES:

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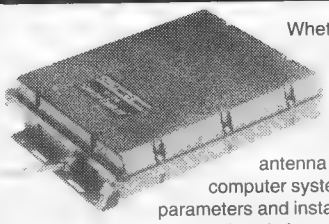
The SG-230 Smartuner
HERE AT LAST



Whether you are a **HAM, LAND MOBILE, MARINE or AIR BAND** operator, you need a efficient antenna coupler. The best on the market today is definitely the SG-230 made in USA by SGC, Inc. The SG-230 is a fully automatic antenna tuner, with locking feature, where a computer system continuously monitors all antenna parameters and instantly selects the right values from more than half a million combinations in its matching circuit to make sure everything is perfectly tuned. With 500 position non-volatile memory build in, and a memory management program, there is only one word for **SG-230 HF AUTOMATIC ANTENNA COUPLER - RELIABILITY !** **PRICE $795**

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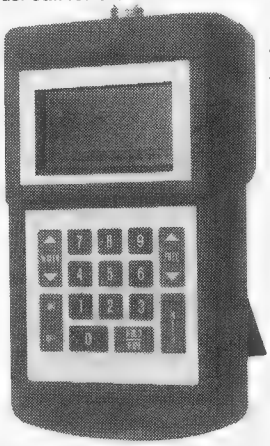

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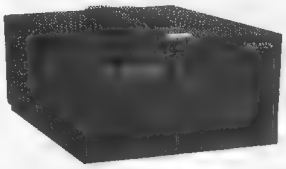

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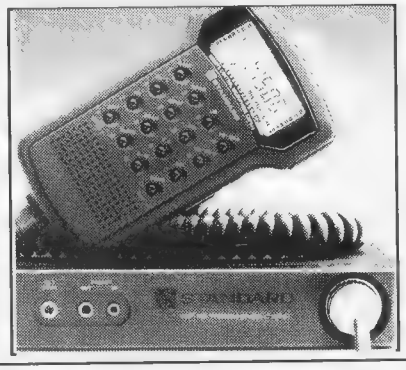

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All your controls and display dail are in the **SPEAKER/MIC!**

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Super wide RX range, 100 memories, stores freq., offset & CTCSS tones and many other features!

JRC NEW JST-145/245
HF/HF+50MHz transceiver

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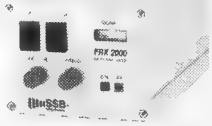
DBA-270 Dual band low noise GaAs FET preamplifier with automatic RX/TX switch and 20db gain!

FRX-2000
Two channel satellite receiver for METEOSAT, with DIGISAT software!



UEK-2000 SAT Special converter for "OSKAR" sat. reception. Build in LNA, noise fig. of 0.6db

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PACKET RACKET OR RACKET IN PACKET!!

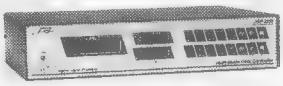
The column headed "PACKET RACKET" is aptly named! The writer presents the material in such a biased manner as to suggest, that he and his colleagues are the first and only suppliers of packet equipment. **We wish to inform you that there are TNC's made by AEA which provide multiple mode, multiple speed and multiple radio port TNC facilities to interface most transceivers, see below!**

AEA DATA CONTROLLERS

represent the most exciting value in amateur radio today.

DSP/MULTI MODE DATA CONTROLLERS. The internal software provides all popular digital amateur data modes. Unique LCD read-out on the DSP-2232 displays the mode and diagnostics for both channel.

DSP-1232 $1495 DSP-2232 $1895



PK-900: THE STEPPING STONE BETWEEN '223MBX & DSP-2232

With features borrowed from the '2232', plus unique additions: dual simultaneous ports, software selectable modems, 9600 baud modem & PACTOR, etc.

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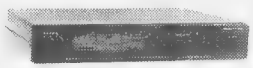
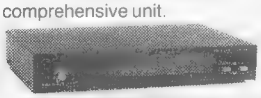


PK-232MBX: MULTI-MODE DATA CONTROLLER.

PK-232MBX, the world's leading multi-mode controller combines all amateur data communication modes in one comprehensive unit.



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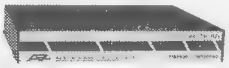

ONLY **$295**

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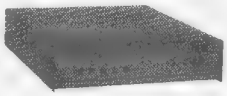
Tired of waiting for packet data? Wish for an easy solution? Now there is one: the PK-96, a cost-effective, high-speed, single-mode data controller.



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PC-PAKRATT for Windows makes control of your AEA Data Controller easier and more enjoyable! **$250**

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Tired of waiting for Weather Reports on Television. Buy AEA FAX II **$275**

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TET-EMTRON antennas are Australian designed and made of best materials available, such as marine grade stainless steel hardware and 6063T83 drawn aluminium tubing. Specially machined heavy duty boom to mast & element to boom brackets, will keep TET-EMTRON antennas on your mast FOREVER!

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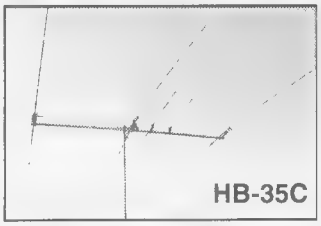
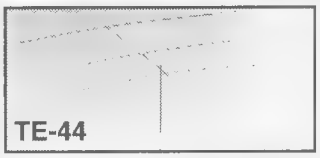
TE-23M 2-ele. mini-beam.....**$440**
TE-33 3-element beam.....**$575**
TE-43 4-element beam.....**$750**
HB-35C 5-element trapless beam **$770**



FOUR BAND BEAMS FOR 7-14-21-28 MHz BANDS



TE-14 rotatable dipole.....**$275**
TE-34 3-ele beam on 14-21-28MHz, 1-ele on 7MHz.....**$695**
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BEAT THE DX "SUN-SPOT" PROBLEM WITH THE NEW FOUR-BAND ANTENNAS

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At Emtronics you can source the largest range of Short wave Radios for professional, amateur and SWL. We also supply SW receiving antennas & accessories!

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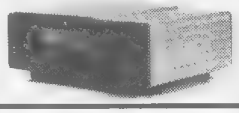

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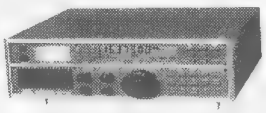

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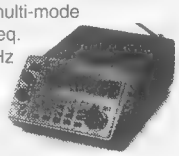
AOR: AR-3000A

The "TOP" of all communication receivers-scanners is the famous AR-3000A. This multi-mode radio covers a freq. range from 100KHz to 2036MHz.



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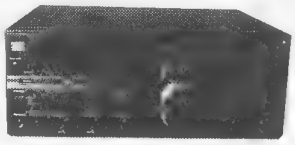
BEST SCANNER

JRC: NRD-535G

World's best short wave receiver. Superb features include double front-end tuned circuit, optional ECSS, band pass tuning, all mode reception, memories, search, scan & sweep and modular construction.



LNA-3000 is a low noise wide band preamplifier for the freq. range between 50 to 3000MHz. Ideal for improving scanner sensitivity, weather satellite, TV & radio signals, and to increase the sensitivity of test instruments!

NEW AOR AR8000

AR8000 is a new breed of radio which combines full compatibility with computer and advanced wide-band receiver technology.

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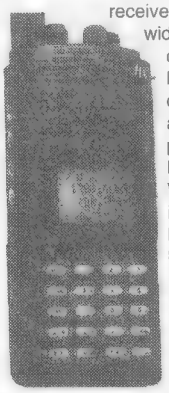

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Ph (09)470 1118
Fax (09)472 3795

VICTORIA AGENT
JOHN HILL
Ph (03)700 5428

AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):
Primary 7.064 MHz. (usually during summer).

Secondary 3.685 MHz. (usually during winter).

Frequencies +/– 5 kHz for QRM.
AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:
AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Phase 3D takes shape.

A recent copy of *The Amsat Journal* carried the usual update on the progress of the phase 3D satellite. It featured a photograph of the space frame being unpacked at the "Integration Facility" at Orlando, Florida International Airport. The story behind this is worth telling.

The spacecraft integration facility is located in the Foreign Trade Zone at the airport. The assembly of the spacecraft will involve collecting, testing and putting together components from various parts of the world. Many of these will be imported from outside the US and, as a result, would be subject to customs charges based on market value. Customs regulations insist on this even though the finished spacecraft will be shipped out of the country when completed. The Foreign Trade Zone at the airport allows this kind of exercise to proceed as long as all work takes place on the premises. To this end an area has been hired and adapted to Amsat's purpose. It includes a clean room with airlock, a storage area, a break (unpacking) area and a workshop area. The photograph shows the unpacking process under way with the clean room in the background.

It's obvious from this and other articles appearing that we are in the "big time" now. This phase 3D will surely be the most ambitious and sophisticated OSCAR yet. The clean room was donated by Hitachi Data Systems and will ensure that there are no more than 10,000 five micron or larger particles per cubic foot of air. This is much cleaner than the requirements for a hospital operating theatre. The clean room was assembled and all was in place just in time when the space frame arrived from Weber State University where it was built. Over 1000 man-hours went into the setting up of the integration facility.

Think of this when you press the button on your transceiver to access phase 3D! The next two years will see the various payload modules mounted and tested, the wiring harnesses put in place and a myriad of other jobs done to complete the spacecraft. It will then be shipped out for thermal, vacuum and vibration testing before its journey to the launch site. The saga continues.....

WiSP

It's interesting to note that Chris ZL2TPO's magnificent program WiSP was written up in that same issue of *The Amsat Journal.* The reviewer wrote a glowing report. Evidently it is sweeping the digital satellite scene in the US, as it is here. As with any complex new software it is being updated constantly by Chris and others as extra features are added. Updates are appearing sometimes daily on the digital birds. Chris's photograph appeared on page 30 of *Amateur Radio* last month when he was in VK for a conference.

MIR News

During October the cosmonauts on board the Russian space station MIR played host to a German astronaut. Dr Ulf Merbold used the call sign DF5DPI. He operated a digital voice memory device connected to the MIR ham rig to give reports on the progress of the European Space Agency's EUROMIR 94 mission of which he was part. Listeners to MIR on the night of 4 Oct were privy to a welcome aboard party with singing, guitar playing and other frivolities. It must have been quite an event for those on board to receive a number of visitors at once. Signals were loud and clear in Melbourne. At the time of writing I have not heard the digitised voice device, but it's early days yet.

AO-21 Problems — Can You Help?

AO-21 has been experiencing some RAMDISK errors, mostly in the area used for storage of the WEFAX test image. The FAX picture has been replaced by AFSK packet telemetry. To help in identifying the cause of the problem, controllers are looking for packet telemetry of RUDAK-2 transmitted from 15 to 18 September 94. If you can help with copy of any part of this period it would be greatly appreciated if you would send the copy via packet to Robert, DD4YR@DB0AAB.#BAY.DEU.EU or via the internet to Peter: db2os@amsat.org. At the time of the errors operations on the host spacecraft caused an increase in temperature of some six degrees C. AO-21 is a small amateur package on board a large Russian satellite. It borrows power from the large craft but it is very much a secondary payload.

AO-13 Eclipses

As you read this, AO-13 will have come through one of its most serious eclipse periods. Thanks are due to the control team of Graham, James and Peter for their excellent job in manipulating the attitude and transponder schedule over the past few months to allow a smooth passage through the eclipse period for the satellite whilst still somehow managing to give almost uninterrupted user access. Thanks also to the users for their patience during this difficult period.

**359 Williamstown Road, Yarraville VIC 3013*
Packet: VK3JT@VK3BBS
ar

WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of September 1994.

L30897	MR I MCFARLANE
L30899	MR K HAMER
L30900	MR R PARSONS
L30901	MR J DRITSAS
VK3BMU	MR N A JEFFERY
VK3MKT	MR P MCCALLUM
VK5MB	MR J MACKISON
VK5ZBT	MR L GARRON
VK6AAF	MR L W HAYWARD
VK6KRD	MR R J DE TRAFFORD
VK6YY	MR D ROBSON
VK7AAA	MR A KWIATKOWSKI

DICK SMITH ELECTRONICS

HUGE Savings on Ex-Demo Gear!

On- Air Demonstrations

Plenty Of On-Site Parking

YAESU

OPEN DAY!

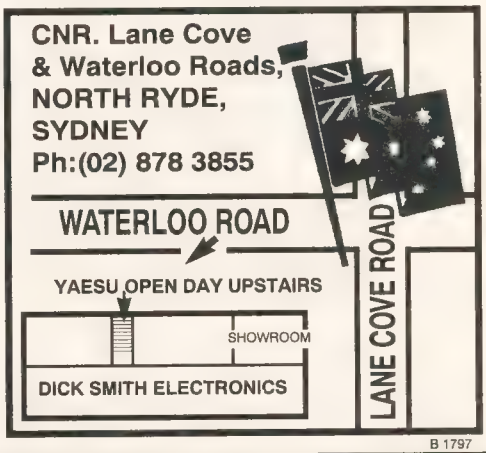
Saturday 12th November 1994 Only

- Special Prices on new and ex-demo equipment, with some items below cost!
- A selection of transceiver and accessory samples at unbelievable prices, many with warranties!
- Qualified Amateur Staff for advice and assistance
- Huge range of all the latest Yaesu equipment on display, plus a large range of antennas and accessories
- Bring your licence with you for On-Air demonstrations
- It's under cover, so come along rain or shine!
- Light refreshments available
- See a selection of great value IBM compatible computers

SUPER SAVER HOTLINE
Ph: 1-800 226610 FREE CALL

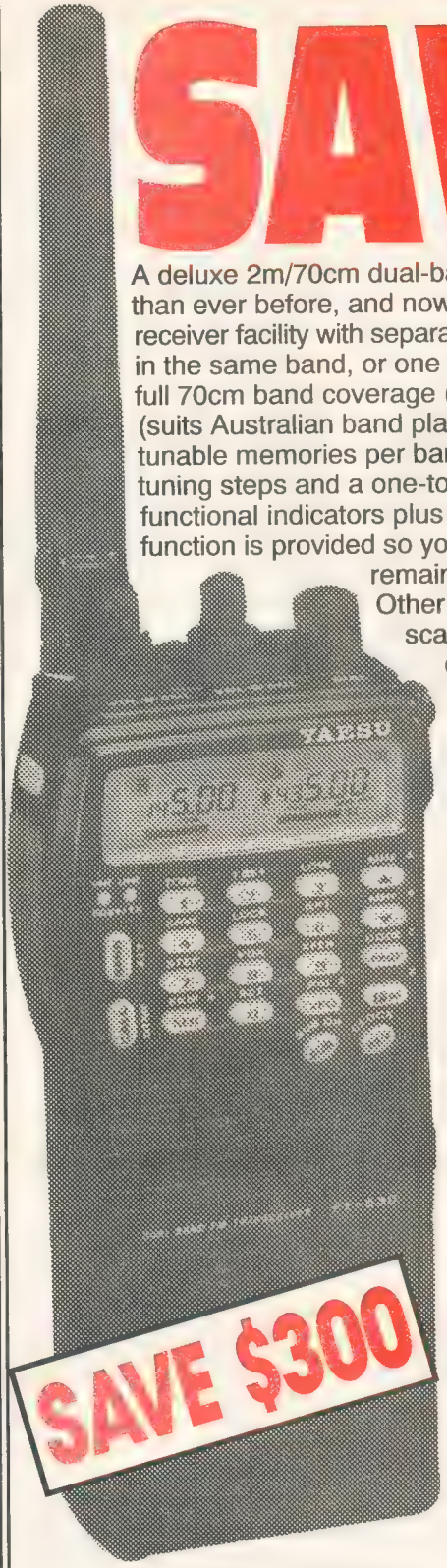
The easy way to save! Just phone us on our toll-free number between 9am and 4pm (Sydney time). We'll quote you our Open Day Special Price on new or ex-demo equipment. Simply quote your credit card number and we'll forward your purchase promptly to you. (Post and packaging extra).

CNR. Lane Cove & Waterloo Roads,
NORTH RYDE,
SYDNEY
Ph:(02) 878 3855



B 1797

SAVE $300!



A deluxe 2m/70cm dual-band hand-held transceiver offering easier operation and more features than ever before, and now at an unbelievably low price! The FT-530 provides a flexible dual receiver facility with separate volume and squelch controls, allowing you to listen on two frequencies in the same band, or one frequency on both bands! Plus, the exclusive Australian version features full 70cm band coverage (420-450MHz), selectable Auto Repeater Shift on both 2m and 70cm (suits Australian band plan), and extended receiver coverage as standard. Two VFOs and 41 tunable memories per band are provided, together with keypad or dial frequency entry, seven tuning steps and a one-touch CALL channel. The dual 5.5-digit LCD screen includes many functional indicators plus separate signal/P.O. bargraphs for both receivers. An LCD voltmeter function is provided so you can even monitor your battery's performance under load and estimate remaining battery life.

Other top features include: Inbuilt dual CTCSS encode/decode, CTCSS scanning, an auto battery saver (ABS) for extended battery charge life, a cross-band repeater facility and inbuilt clock with alarm and snooze functions. Also provided is VOX circuitry for use with the optional YH-2 headset, a user replaceable lithium back-up battery, and DTMF selective calling and paging. A DC supply jack allows transceiver powering and NiCad charging, with RF output in four steps up to 5W at 12V. The FT-530 comes complete with a high-capacity 1000mAH NiCad battery, antenna, belt-clip, carry case and approved AC charger.

Cat D-3620

Specifications

Frequency range:

Transmit	144-148MHz, 420-450MHz
Receive	130-174MHz, 420-500MHz, 800-950MHz

Current Consumption:

Auto power off	150uA
Standby (saver on)	16.8mA (both bands)
Dimensions:	55(W) x 163 (H) x 35mm(D)

Transmitter:

Power Output:	5, 3, 1.5, 0.5 (at 12V)
RF Power Output	2.0W (2m), 1.5W (70cm) (Supplied 7.2V 1000mA/H NiCad)

Receiver:

Sensitivity:	2m:<0.158uV, 70cm: <0.18uV
(Ham bands only, 12dB SINAD)	
Audio Output	300mW at 8 ohms (at 12V)

YAESU

Hurry,
This incredibly low price is only valid until 31st December 1994, or while stocks last.

Customers who purchased an FT-530 between 15/8/94 and 30/9/94 as part of our previous promotion should have received bonus gift vouchers to cover their purchase. Please contact the store where you purchased your FT-530 if you have not received your Gift Vouchers.

2 year warranty

$699

End Of Year Specials!

YAESU

Grab a Christmas bargain while stocks last. Prices are valid until 31st December 1994, and some items have only limited stock available. Some units may be shop soiled, but full warranties apply.

1. Revex HF/6m W502 SWR/PWR meter, made in Japan, with accurate P.E.P. metering
   Cat. D-1360 **$179** ***SAVE $20***

2. Yaesu FT-26 2m handheld, with 700mA/H NiCad, carry case, extended receive, ***2 year warranty***.
   Cat. D-3600 **$399** ***SAVE $70***

3. Yaesu FT-415 deluxe 2m handheld, with 1000mA/H NiCad, carry case, extended receive and many more features.
   CLEARANCE Cat. D-3610 **$499** ***SAVE $30***

4. Yaesu FT-815 deluxe 70cm handheld, with 1000mA/H NiCad, carry case, 430-450MHz coverage, ***2 year warranty***
   CLEARANCE Cat. D-3615 **$499** ***SAVE $200***

5. Yaesu MH-12A2B standard speaker/mic.
   Cat. D-2115 **$59.95** ***SAVE $10***

6. Yaesu MH-18A2B mini speaker/mic.
   Cat. D-2117 **$49.95** ***SAVE $10***

7. Digitor 2m RF amplifier, 0.5 to 5w input, up to 30w output, GaAs Fet receive pre-amp, large heatsink
   Cat. D-2510 **$139.95** ***SAVE $30***

8. Mastercharger intelligent fast charger suit handhelds, complete with cigarette lighter lead. Suits most Yaesu handhelds, optional adaptors for other models/brands.
   Cat. D-3850 **$159.95** ***SAVE $10***

9. Yaesu FT-712R 70cm mobile transceiver, 35w FM output, 430-450MHz coverage, hand microphone, ***2 year warranty.*** Cat. D-3330 **$599** ***SAVE $150***

10. Yaesu FT-5200 deluxe 2m/70cm mobile transceiver, 50w output on 2m, 35w output on 70cm, 32 memories, ***2 year warranty***
    Cat D-3310 **$1399** ***SAVE $100***

11. Revex W540 VHF/UHF SWR/PWR meter, made in Japan, covers 140-525MHz.
    Cat. D-1370 **$179** ***SAVE $20***

12. Yaesu FT-840 H.F. mobile transceiver, ***2 year warranty,*** with hand microphone.
    Cat. D-3275 **$1695** ***SAVE $200***

13. Yaesu FT-890 deluxe HF mobile transceiver, 160m-10m, extended receive, all mode (SSB,CW,AM,FM), RF speech processor.
    Cat. D-3270 **$1995** ***SAVE $300***

14. Yaesu FT-990 HF base station transceiver, in-built auto antenna tuner and AC power supply, RF speech processor, DDS, digital audio filtering, IF shift and IF Notch, 500Hz CW filter standard. Ex-demo units only at this price!
    Cat. D-3260 **$3295** ***SAVE $700***

15. Yaesu SP-6 medium size desk speaker with audio filters.
    Cat. D-3265 **$199** ***SAVE $50***

16. Yaesu SP-5 large desk speaker with audio filters
    Cat. D-3230 **$199** ***SAVE $50***

17. Yaesu NC-15 desktop charger, for parts use only.
    Cat. D-3511 **$2.95**

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Yaesu stocks and some antennas not held at all stores, please contact your local store for availability, or phone 008 22 6610

B 1823

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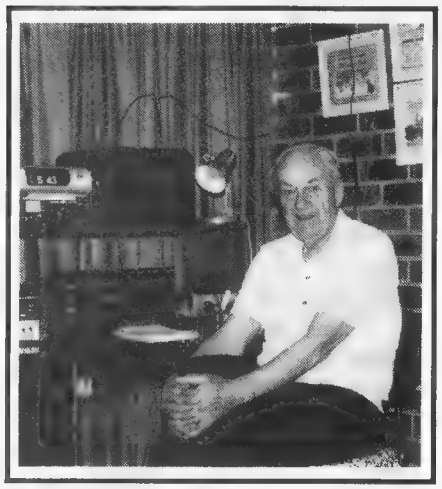
STORES ACROSS AUSTRALIA AND NEW ZEALAND

*MAJOR AMATEUR STOCKIST STORES SHOWN IN RED

AWARDS

*John Kelleher VK3DP — Federal Awards Manager**

DX Profiles



Ivor Stafford VK3XB

Ivor became acquainted with the "wonder of wireless" through reading the articles by Arthur Russell in "PALS", a boys' paper of the mid-1920s. By catching rabbits and selling the skins, he gained enough money to build a "one valver" in 1928.

He discovered that amateurs broadcast music on Sunday mornings, and late at night. He heard Morse code instruction broadcast by OA3CR, the Coburg Radio Club. He learned the code and practised, using a bread knife and a brass bolt. He then read Max Howden's "With the Amateurs" in the *"Listener-in"*, converted the broadcast receiver to "short wave", and found the 80 and 40 metre bands. In 1933 Ivor gained his AOCP at the Working Men's College. In 1934 he took out the callsign VK3XB and from a Mallee school came on air with 0.6 of a watt input. By 1936 he had a V beam, 500 feet a side, and worked W9BQM with 0.36 of a watt. All this time Ivor was coaching Mavis (now VK3KS) for her AOCP. From 1951 to 1991 his QTH was at Box Hill South, where he availed himself of a TH6DX, and many dipoles. His present QTH is a retirement village, where no masts, poles, or other conspicuous contraptions are permitted. However, 137 countries have been worked using 100 watts and an end-fed 35 foot piece of wire, which is just above the roof tiles. He operates on seven bands with simple couplers, an efficient earth, and indoor radials. While at the Box Hill QTH, Ivor, with Mavis, concentrated on Contests and DX. His accomplishments include: 5 times winner for Australia in ARRL contests; continental leader 7 MHz in 1962 CQ WW Contest; world 4th place on 10 metres in 1971 CQ WW Contest; winner for Australia in RSGB 7 MHz, OZ, YO, HK, and WAEDC Contests; WAS on 7 MHz (novices only); and 5 Band DXCC. Ivor was also QSL Manager for VK3 from 1954 until 1968, as well as being the Intruder Watch Co-ordinator for seven years. He is also a member of the First Class CW Operator's Club, and a Life Member of the WIA. His current CW DXCC tally is 311.

His hints for new DXers include *"listen, listen, listen, then call — the band may not be dead; your antenna is the most important item of your equipment; be patient with slower operators, there is always someone listening; be courteous, and observe the abbreviations used by experienced operators; make your contacts in minimum time (while contesting), then QSY off the frequency; investigate your contacts later".*

Mavis Stafford VK3KS

This report is condensed from Mavis's own words.

"Ivor VK3XB was coaching my brother. Unbeknown to him, I learned the Morse Code. When my brother went to Gippsland, I became Ivor's pupil. By June 1939, I had the callsign VK3KS, at Buchan, using a CL4 crystal oscillator and two CL4s as bi-push doublers, with 3 watts input. After making 110 contacts, WW2 forced suspension of activities. In 1943 the pupil married the teacher. Operating re-started in 1946 at Mount Best, a very windy QTH, where we had 2.5 watts input from batteries. By 1951 we were at Box Hill, and by 1967, had a TH6 Yagi, and high dipoles. In 1950 I joined YLRL and participated in many contests, using both CW and Phone. I won eight gold cups, one silver cup, six plaques, and over 100 YLRL Contest certificates, and was second in the SAC CW Contest (1960), first in the Asia CW DX Contest (1971) and first in the YLRC Italiano. I then joined YLISSB and teamed with Ivor for first place in several contests. I am the holder of DXCC, WAZ, WAS, YLDXCC, WPX, DXCC/QRP, WAS/YL, WAP and WXBR, and am a member of ALARA, CLARA, WARO, JLRL and the Radio Amateur's Old Timers' Club. In 1966 I was honoured by being invited to join the First Class CW Operator's Club. There are very few women members. I was Historian and Awards Custodian for ALARA from 1980 to 1991 and was made an Honorary Life Member of ALARA in 1983. My advice for DX aspirants is: Listen, listen, learn and practice. My present CW DXCC tally is 297."

Columnist's Note: I am honoured to be able to say that Mavis and Ivor are included amongst my best friends, as my mentors, and were always ready to use their broad experience to help and assist wherever possible. Ivor was also Headmaster to my children.

Jim Rumble VK6RU

At the age of 11, in 1928, Jim and a school friend became interested in amateur radio. Through Scouting, and in his teen years, he met others with the same interests, and later learned that there were licensed amateurs in existence. Jim was licensed in late 1937 as VK6RU. A condition of the licence in that era was that CW operation was permitted for a probationary period of only six months. To quote Jim, "I quickly got to like the mode, and still do through FOC membership for over 20 years.

With war in 1939, my licence was suspended, and what equipment I had was taken by the licensing authority for security keeping until 1945. Licences were returned in January 1946, after my return

from active service as a commissioned officer, mainly in the south west Pacific. During this time I had gained some US navy "surplus" equipment. Pre-war, I had amassed some 80 DX countries on 10, 20 and 40 metres. Post war saw only 10 metres available, and naturally much activity was around in this peak sunspot cycle. Other bands were made available later.

Chasing DX was the prime interest and it was not long before I had DXCC, WAC, WBE and BERTA awards amongst many others which were available in the 1950s. I had built three rigs for AM phone and CW, and two separate receivers in the first post-war decade. However, it was not long before I learned of the Collins "stable", and soon had a 75A4 on the table. Then SSB was found to exist through my old friend ZS6KD, and the Collins S-Line gear was added by the mid-1950s. In 1965, I moved to my present QTH at City Beach, some eight miles south from Perth, a half-mile inland, and 200 feet above the Indian Ocean. By 1970, and 60,000 contacts in my log, the first 300 DXCC countries had been achieved and passed. The urge to get away and "eyeball" some of contacts led to four overseas trips, where I was greeted handsomely and treated with overwhelming hospitality. My late wife Joan and I were always together on these ventures.

Now that I live on my own, my three sons, their wives and five granddaughters take good care of me. My interest in the WIA has been keen since joining the body in 1937, and I have managed the VK6 QSL bureau since 1939. I spent two years as President and many years as a councillor in the early post-war decades. I was awarded life membership of the WIA in 1974, for services rendered to VK6. Amateur radio has been a rewarding hobby over these past 56 years. My advice to the young DXers today is to work hard, and use what information you have to the best of your ability. These days I do a fair amount of mobile communication, and have 106 countries confirmed from the vehicle".

Jim's DXCC Open Total is 326/380.

Local Awards

The North East Radio Club will run a special event station for the 10th Adelaide Grand Prix, and provide an award for amateur radio operators. The callsign will be VI5AGP.

VI5AGP will be active from 30 October to 19 November 1994 on HF and VHF. To obtain an award amateurs must contact the above station, and receive a sequence number. By sending $AUS5.00 or 5 IRCs, along with the sequence number, QSO information, and your return address, a certificate featuring the late Ayrton Senna will be forwarded to you. The address is: North East Radio Club, PO Box 36, Modbury North, SA 5092 Australia.

This is an advance notice of the intentions of the members of the Hervey Bay Amateur Radio Club Inc to sponsor a very special event. The callsign will be VI50PEACE. Operation of this Commemorative callsign will commence at 0001 UTC on 1 August 1995, on as many bands as possible, and for as many hours as possible, until 2400 UTC on 31 October 1995. The operation is in commemoration of the men, women and children who lost their lives or received other devastating forms of anguish due to the war torn years.

The Solitary Islands Award

This award has been introduced by the Coffs Harbour and District Amateur Radio Club to publicise the creation of the Solitary Islands Marine Award in 1991.

To obtain this award, a points score of 25 is required, as follows: for VK and ZL stations, 5 points for the CHADARC net controller VK2EP, or his deputy, and 2 points for each member of CHADARC worked; for DX stations 10 points for the CHADARC net controller, and 5 points for each CHADARC member worked.

General Conditions

1. Contacts made with the same station on the same band must be 24 hours apart, but a single contact with the same station, on several or all bands, on the same day is permitted.
2. Contact may be made on any recognised VK amateur band, in any legal mode. 3. SWLs may apply for the award after logging CHADARC Inc members and the same points scores apply.
4. Applicants must send an extract from their log, detailing the dates and times UTC, frequency, mode, callsign, and name of contacts for verification.
5. The Awards Manager's decisions will be subject to CHADARC Inc committee approval. Applications should be sent to: The Awards Manager, C/o CHADARC Inc, PO Box 655, Coffs Harbour, NSW 2450 Australia.

*PO Box 2175 Caulfield Junction 3161

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QSP News

Thirtieth Anniversary

The WIA offers its congratulations to the Radio Amateur Society of Thailand on the occasion of its Thirtieth Anniversary. This will be recognised by a week of celebrations in Bangkok, culminating in a gala dinner on 18 November 1994.

Remember to leave a three second break between overs when using a repeater.

Club Corner

Shepparton & District Amateur Radio Club Inc Communications Day Draws Hundreds to Shepparton

The Shepparton & Districts Amateur Radio Club Communications Day held on 18 September proved popular.

The event was opened by the President of the Wireless Institute of Australia, Victorian Division, Jim Linton VK3PC. During his address Jim said that changes in licensing requirements will soon make it easier for people from computer backgrounds to enter the hobby of amateur radio.

Over two hundred amateurs and friends attended. The majority came from regional Victoria and southern New South Wales, but a number travelled from the Melbourne metropolitan area and one group came from South Australia.

The latest communications equipment was on display and the Club wishes to thank A J & J Coman Antennas, Daycom, Dick Smith Electronics, Icom Australia, Melbourne Satellites, Nally Towers, Strictly Ham and ZRV Electronics for making the day a commercial success. Thanks also to John VK3LM and Alf VK3CQE for the slow scan TV demo and Wayne VK3XQA for the ATV display. All remaining space was taken up by the amateur traders who seemed to purchase as much equipment as they sold. The local Vintage Radio Club displayed a number of beautifully restored wireless sets from days long gone. Jan VK3ALF and his catering team deserve a special thanks for the five star meal.

Peter VK3YF, event Publicity Officer for the Shepparton & District Radio Club, said that the Communications Day was one of the most successful organised by the club. This was due to the great support of wholesalers, retailers and traders involved. He said the event will be held again in September 1995 and planning was already under way.

The club hoped all who attended had an enjoyable day. Any positive or negative feedback will be welcomed at PO Box 692, Shepparton Vic 3630.

Peter O'Keefe
Publicity Officer

Summerland Amateur Radio Club Computer Expo

A Grand Summerland Computer Expo is being organised by the Summerland Amateur Radio Club. The Lismore City Hall, on 26 November from 9 am, is the place to be to have an enjoyable day. Many commercial displays and demonstrations of the latest in computers and electronic equipment will be on show.

Bring and buy tables will be available for your pre-loved gear. Refreshments will be on sale. Amateur radio and packet radio stations will be set up and operating. And there will be lucky door prizes throughout the day.

Admission $2 each, or $4 per family (same as last time). For more information contact Steve VK2JSM (066) 62 6693; Ric VK2EJV (066) 89 5137; Graeme VK2GJ (066) 85 1336 or try our Packet BBS, VK2YDN-1 via VK2RPL-2 66 8900. The Club's postal address is, PO Box 524, Lismore NSW 2480.

Graeme Virtue VK2GJ
Publicity Officer

Old Timers Club

Would club members please note two corrections to previously published information:

1. *Amateur Radio* September 1994 page 35 re QSO Parties. The second Monday of March 1995 will be the 13th not the 6th.
2. Club Magazine *"OTN"* September 1994 issue page 27, ie inside back cover regarding 80 metre transmissions. The frequency for both the morning and evening transmissions will be 3.650 MHz +/– QRM. My fault both times. Sorry about that.

Call Back Procedure all Frequencies

We are sure that many more members listen to the various transmissions than wait around to take part in the following call back. But, as you will readily understand, your broadcast team would be greatly encouraged to get a clearer picture of how many members they are really working for.

So, in future call back sessions, the operator will ask for those who have listened, but who want to get away, to just give their call sign and name for the record. The operator will then ask for members who wish to give reports or to make comments to call in.

We have been surprised at the relatively few members who have checked in on 80 metres, considering the deteriorating sun spot conditions, and so would appreciate more feedback from members on both the 80 metre transmissions.

RAOTC Qualification

The VK5 WIA broadcast on 9 October 1994 quoted Old Timer membership qualifications which only apply in South Australia for luncheon meetings and the like. They do not apply to membership of the Radio Amateurs Old Timers Club, for which the qualification is to hold, or to have been qualified to hold, an amateur radio licence for 25 years or more; there is no qualification as to age except for honorary life membership for existing members reaching the age of 90.

Allan Doble VK3AMD

WIA News

VK Ham Visits Russian Space City

Steve Curtis VK3CAW, from Hamilton in Western Victoria, spent eight days in late September visiting Star City (Zvyezdny Gorodok) in Russia where the MIR space station and launch vehicles are made and where MIR astronauts are trained.

"Only a handful of Westerners have ever seen the facilities and factories there," said Steve, who is a school teacher at Hamilton College, "It's still a closed area, one of the few remaining in Russia these days." It was an undreamt-of experience for Steve, and it arose from a chance encounter last June when he was one of ten Australian educators selected to attend the Australian International Space School, held in Sydney that month. The Space School is concerned with introducing space technology to students, and looking at ways it can be incorporated into maths and physics lessons.

In 1992 Steve had used amateur radio with his Year 11 maths students to make contact with the MIR orbiting space station as a classroom activity to demonstrate

Contests

P Nesbit VK3APN — Federal Contest Coordinator*

Contest Calendar Nov 94-Jan 95

Nov 12	ALARA Contest	
Nov 12/13	WAE RTTY DX Contest	(Jul 94)
Nov 12/13	OK-DX CW Contest	(Oct 94)
Nov 12/13	ARRL International EME Competition	(QST Sep 94)
Nov 19/20	IARU Region 1 160 m Contest	
Nov 19/20	All Austria CW Contest	
Nov 26/27	CQ World-Wide DX CW Contest	(Sep 94)
Dec 2/4	ARRL 160 m Contest	
Dec 10/11	ARRL 10 m Contest	
Dec 26-Jan 28	Ross Hull VHF/UHF Contest	
Dec 31	ARRL Straight Key Night	
Jan 1	ARRL Straight Key Night	
Jan 14/15	VHF/UHF Field Day	
Jan 14/15	HA DX CW Contest	
Jan 27/29	CQ WW 160 m DX Contest	

The usual spiel is held over this month due to pressure on space, so I will simply thank VK3DMS, VK3KWA, VK5OV, G6LX *(IARU Region 1 CSG Newsletter), CQ, QST, and Radio Communications.* Until next month, good contesting!

73,
Peter VK3APN

Contest Details

The following contest details are supplemented by the "General Rules & Definitions" published in April 1993 *Amateur Radio.*

ALARA Contest (Phone/CW)

November 12, 0001-2359z Saturday

Amateurs and SWLs worldwide are invited to enter this phone/CW contest, which is sponsored by the Australian Ladies Amateur Radio Association, and which takes place on the second Saturday of November each year.

YLs work everyone, and OMs and Clubs work YLs only. Use 80-10 m only, and to make stations easier to locate, suggested frequencies are 28380-28410, 21380-21410, 21170-21200, 14250-14280, 7070-7100, & 3560-3590. Each station can be contacted twice per band, once on phone, and once on CW. No lists, nets or crossmode contacts please.

YLs should call "CQ ALARA CONTEST" or "CQ TEST ALARA", and OMs "CQ YL". ALARA members should send RS(T) + serial No starting at 001 + whether ALARA member + name. OMs should send RS(T) + serial No + name. Club stations *must* identify as a club station each contact, and can not use personal callsigns whilst operating as a Club member.

Score 5 points for each QSO with each ALARA member, 4 points for each QSO with a YL non-member, and 3 points for each OM or Club station QSO. On CW, if either or both operators is a Novice, score double points. SWLs score 5 points per ALARA member logged, and 4 points per YL non-member logged.

Logs should show date/time UTC, band, mode, Callsign worked, RS(T) & serial No sent and received, name of operator worked, status of the station worked (YL ALARA, YL non-member, OM, or Club), and QSO points. Attach a cover sheet showing full name, callsign, address, and final score, and send to Mrs Marilyn Syme VK3DMS, PO Box 91, Irymple, VIC 3498 Australia, to be received by 31 December.

The Florence McKenzie CW Trophy will be awarded to the highest scoring VK YL novice scoring at least 50 points. Because of its size and weight, the actual trophy will not be forwarded, and instead a certificate bearing a photo of the trophy will be sent to the winner. Trophies will also be awarded to the top scoring Australian and DX YLs. A comprehensive range of certificates will also be awarded.

IARU Region 1 160 m CW Contest

November 19/20, 1600z Saturday to 0800z Sunday

This is actually a collection of 160 m contests sponsored by several amateur societies in Region 1 (Europe), arranged

in a practical way the mathematics of satellites. In 1993 he again used amateur radio contact with MIR to introduce concepts of gravity and satellite orbital physics to his Year 12 physics students. Steve's students were able to speak to MIR astronaut and amateur, Anatoly Solovyev U6MIR.

Subsequently, Steve's curriculum material and innovative teaching strategy was published for other teachers to use.

Attending the International Space School course was the Vice Rector of the Siberian Aerospace Academy, Victor Filatov, who was so enthusiastic about Steve's work he arranged for his trip to Star City, 45 km North East of Moscow.

As it turned out, Steve was the only ham among the seven other people from various countries who toured the MIR facilities. All had had deep involvement with the Russian space program, said Steve. Despite it being military-run and closed to the general population, Steve was permitted to take any photographs he wished.

He spent an evening with Anatoly U6MIR, with whom he'd had his first MIR-school linkup back in 1992. During a tour of the MIR training facilities, where there's a full-size working mock-up of the space station, Steve asked where the 2 m and 70 cm amateur antennas were located on the real spacecraft. The technicians there admitted they didn't know, but Anatoly U6MIR ventured that they had used magnetic-base antennas. True ham ingenuity — in space!

As a result of his Star City trip, Steve has been asked to inaugurate a summer space school which would take 20 high school students to Star City each year, where they would work with Russian scientists and get hands-on experience with space science and technology. "It's a unique idea; nothing like this is offered by the US space program," he said.

The plan is to organise the first trip to Russia next August and Steve is seeking funding sources to support it. Meanwhile, he's still promoting the use of MIR and amateur radio in high school science and maths courses.

to coincide on the one weekend. Although mainly intended for QSOs between European stations, contacts with non-Europeans are also allowed. As European activity is likely to be considerable, if conditions are right and with a degree of luck, it might even be possible to break through the QRM and work some Europeans from Australia on top band.

According to the draft rules, the exchange is RST + serial + location code (as the codes to be used by non-European stations are not specified, to keep it simple I suggest "VK" be used, as required for the US 160 m contests). Score 1 point per QSO, and multiply by the number of different location codes worked. Although the contest is jointly sponsored by several societies, OVSV seems to be the main driving force, therefore it is suggested that non-European logs be sent to "OE4BKU, HF Manager OVSV, Theresiengasse 11, A-1180 Vienna, Austria" (postmarked by 31 December).

Since the final rules have yet to be received, the precise details cannot be guaranteed, however at least it's a starting point. Hopefully things will have firmed up by next year's event.

ARRL 160 m DX CW Contest

December 2/4, 2200z Friday to 1600z Sunday

The object in this contest is to work as many W/VE stations as possible. Categories are: Single Operator (QRP to 5 W, Low Power to 150 W, and High Power above 150 W O/P), and Multioperator single TX. Exchange RST (/MM and /AM stations should add ITU region 1, 2 or 3). W/VE will add ARRL/CRRL Section. Note that 1830-1850 is recommended for intercontinental QSOs.

Score 5 points per QSO. The multiplier is the total number of ARRL/CRRL sections plus VE8/VY1 worked (max 77), and the final score equals QSO points x multiplier. Include a dupe sheet for 200+QSOs. Logs on MS-DOS disk are welcome. Send logs postmarked no later than 30 days after the end of the contest to ARRL Contest Branch, 225 Main Street, Newington, Connecticut, CT 06111. Certificates will be awarded to the top scoring station in each category, in each DXCC country. Note that the use of non-amateur radio means of communication during the contest (eg telephone) is not allowed for the purpose of soliciting QSOs.

ARRL 10 m Contest (CW & Phone)

December 10/11, 0000z Saturday to 2400z Sunday

This is another popular ARRL contest, which usually attracts a good field from this part of the world. It runs on the second full weekend of December each year, and the object is to work as many stations as possible on 10 m phone, CW, or mixed. Maximum operating period is 36 hours, and listening time counts as operating time. Categories are as for the 160 m contest (see above). Send RS(T) plus serial number. W/VE will send RS(T) plus state or province. CW entrants should stay below 28.3 MHz, avoiding beacon frequencies. Note that 28.09-28.13 MHz has been set aside for slow speed code 10-13 wpm. Stations entering the mixed mode section may work stations once on CW and once on phone.

Score 2 points per phone QSO, 4 points per two-way CW QSO, and 8 points for CW QSOs with US novice or technician stations signing /N or /T (28.1-28.3 MHz only). Multipliers are the 50 US states plus District of Columbia, plus Canada NB NS (VE1), PEI (VE1/VY2), PQ (VE2), ON (VE3), MB (VE4), SK (VE5), AB (VE6), BC (VE7), NWT (VE8), YUK (VY1), NF (VO1), LAB (VO2), plus DXCC countries except US and Canada, plus ITU Regions (/MM & /AM QSOs only). Multipliers are counted separately on each mode. Final score is total QSO points x total multiplier. Include a dupe sheet for 500+ QSOs. Logs should be sent as for the 160m Contest (see above).

Results of 1993 ARRL RTTY Roundup

(Call/Score/QSOs/Mult/Hrs)
VK2RT (+op) 8,364 164 51 24
(no other VK/P2 entries)

Results of 1993 CQ WW RTTY DX Contest

(Call/Band/Score/QSOs/Pts/Zones/Countries/States & Provinces)

VK6HD*	A	201,760	333	970	55	101	52
VK2RT	A	102,459	286	833	39	64	20
VK3EBP*	14	10,899	62	173	21	36	6
VK8BE	14	720	15	45	8	8	0

Results of 1994 Australasian Sprints

Presented by David, VK5OV

Entries for the 9th Australasian Sprints totalled 13 CW and 29 phone. Unfortunately, no CW logs were received from Novice class entrants this year, even though three novice calls appeared in other entrant's logs. Two SWL phone entries were received.

Conditions were fairly good and there were few comments about the contest, although it appears that not everyone agreed with the rule change which removed the requirement to include RS(T) with the serial number. Perhaps this needs a rethink, and further correspondence would be most welcome.

The Adelaide Hills Amateur Radio Society and the VK5/8 Division of the WIA congratulate the overall winners, Russ Coleston VK4XA (CW) and John McRae VK5PO (phone, second year running), as well as the winners in the individual call areas.

The results are shown below, with certificate winners indicated by (*) and the overall winners by (**).

CW

VK1JE*	9
VK2RJ*	24
VK2FUH	15
VK3EFO*	15
VK3FG	13
VK3OZ	9
VK4XA**	26
VK5PO*	25
VK5AFO	21
VK5AGX	13
VK5UE	7
VK6BN*	18
VK7HX*	6

Phone:

VK1JE*	34
VK2LEE*	55
VK2FUH	31
VK3TI*	43
VK3CYL	40
VK3NFJ	25
VK4CRO*	52
VK4IL	39
VK5PO**	61
VK5KCX	52
VK5YX	52
VK5NOS	47
VK5BKM	41
VK5PSG	36
VK5UE	35
VK5ZQ	32
VK5RV	27
VK5TD	23
VK5AZS	12
VK6BN*	44
VK7HX*	16
VK7MSM*	16
ZL1BVK*	48
ZL1AGO	31
ZL1QT	17
ZL1CTC	12
ZL1VSE	8
ZL2AJB*	37
P29VH*	50
L40018*	27
ZL2329*	12

Ross Hull Memorial VHF-UHF Contest 1994-1995

Presented by John, VK3KWA

Earlier this year I suggested two rule changes for the Ross Hull Contest, which were to extend the contest period, and to base scoring on the 100 best contacts made on each band. The idea behind

these changes was to shift the emphasis back to DX operation, and to remove the need to fill the log with large numbers of local to medium-range contacts. I am pleased to say that these proposals have been very well received, and am very hopeful that they will put more life back into the contest.

The "100 best" scoring will remove the need to risk laryngitis or divorce during the contest, and also enable a much larger number of active VHF operators to participate. In particular, it will make it much easier to build up a competitive log of DX contacts even if you do not live in an area with a large local VHF population.

The extended contest period will provide more DX opportunities by straddling more of the DX season, whilst also reducing the pressure and allowing contest activity to fit in with other personal commitments. It also provides enough time to head off on a portable expedition, to increase the opportunities for good QSOs.

I will reiterate my usual request to keep DX calling frequencies as clear as possible, and please send your log in even if you don't think it's a winning score. It certainly makes cross-checking easier, and the more logs listed in the results for this year's contest, the more activity next year. Besides, even modest entries can often win, depending on the section!

The 1995 VHF-UHF Field Day will occur on 14 to 15 January 1995, during the Ross Hull Contest period. This will provide an extra opportunity for DX contacts. Rules for the Field Day are similar to previous years, and will appear next month.

Introduction

The WIA maintains a perpetual trophy in honour of the late Ross Hull and his pioneering achievements in the VHF-UHF field, especially the discovery and investigation of VHF tropospheric propagation. The name of each year's contest winner is engraved on the trophy, and he/she will receive an attractive wall plaque and certificate. Other certificates may also be awarded to top scorers in the various divisions of the contest. The contest is not confined to WIA members.

Duration: 0000z Monday 26 December 1994 to 2400z Saturday 28 January 1995 (ie 1100 EST on Monday 26 Dec to 1100 EST on Sunday 29 Jan).

Sections: (A) Single operator multiband; and (B) single operator single band. All entrants will be scored for both sections (A) and (B).

General: All amateur bands above 30 MHz may be used. One contact per station per band per UTC day. Crossband, repeater and satellite contacts are not permitted. Contest exchanges should not be made on recognised DX calling frequencies. Entrants may operate from any location.

Exchange: RS or RST plus a three-digit serial number.

Scoring: Scores will be based on up to 100 contacts on each band, as nominated by the entrant. Each contact will be scored at one point per 100 km or part thereof (ie up to 99 km, 1 point; 100-199 km, 2 points; etc). On 6 metres only, the maximum number of points per contact is 10. The band multipliers are:

6m	2m	70cm	23cm	13cm	Higher
x1	x4	x7	x10	x13	x16

Sample Scoring Table:

Band	6 m	2 m	70 cm	etc
	---	---	---	---
"100 best" score	xxxx	xxxx	xxxx	xxxx
Band Multiplier	x1	x4	x7	xX
	---	---	---	---
Total	xxxx +	xxxx +	xxxx +	xxxx = xxxxx (GRAND TOTAL)

Logs: To enable cross-checking, logs must show *all* contacts made during the full contest period. The contacts nominated for scoring purposes must be marked clearly in the log, or else listed in separate log extract sheets.

Separate logs for each band are welcome but not essential, but common logs *must* show QSO points in a separate column for each band.

Logs must show the following for each contact:

— Date and UTC time;
— Station location (if operating portable);
— Callsign of station worked, band and mode;
— Reports and serial numbers sent and received;
— Location or Maidenhead locater of station worked (if not QTHR);
— Estimated distance worked and points claimed.

The contest manager reserves the right to verify and correct distance estimates.

Cover Sheet:

Logs must be supplied with a cover sheet showing:

— Operator's callsign, name and address;
— Station location (if different from the postal address);
— A scoring table set out as the example below;
— A signed declaration that the station has been operated in accordance with the rules and spirit of the contest.

Deadline:

Post logs, to be received by Monday 20 February 1995, to WIA Ross Hull Contest Manager, PO Box 3162, Caulfield Junction, VIC 3161. Early logs would be appreciated.

Disqualification:

The normal rules apply. Entrants may be disqualified for violation of the contest rules (eg evidence that claimed contacts were not made), or if logs are incomplete or illegible. *Note that persistent use of DX calling frequencies for contest exchanges may lead to disqualification.* Entries are accepted on the understanding that rulings of the contest manager are final.

Awards:

The overall winner will be the top scorer in Section A. Awards will also be made to the top scorers on each of the following bands: 6 m, 2 m, 70 cm, 23 cm, 13 cm, microwave (all bands above 3 GHz).

Notes on Calculating Distances:

Absolute accuracy is not needed. All you need to know is whether the distance is above or below the nearest multiple of 100 km. An easy method is to use a compass to draw 100 km circles around your location on a map. Better estimates can be made from 6 digit Maidenhead locaters, using simple computer programs such as those published in December 1990 and January 1991 *Amateur Radio.* An accurate and fully error-trapped program is available, which also calculates bearings and converts between lat/long and Maidenhead locaters, from John Martin VK3KWA (QTHR), upon receipt of a DOS disk (any format) in a mailing box, together with return postage.

*PO Box 2175, Caulfield Junction, VIC 3161

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Divisional Notes

VK6 Notes

Peter Parker VK6BWI

NCRG HamFest 1994

WA's biggest amateur radio event is on Sunday (November 6). It will be held at the Les Hansman Community Centre, 246 Walter Road, Morley, starting at 10.00 am. Bring your unwanted junk to the NCRG stall, to be sold on your behalf. Also, remember to take your homebrew projects along to be entered in the Homebrew Equipment Competition. In addition to a swapmeet-style car boot sale, you can visit stalls run by commercial vendors and radio clubs. There is no need to bring your lunch; food and drinks will be available on-site.

Free Intruder Watch Information Package Available

Help rid our exclusive amateur bands of illegal transmissions — become an Intruder Watcher. It's easy to write out an Intruder Watch report, and standard forms are available. If you're unsure as to what constitutes an intruder, contact the VK6 Intruder Watch Co-ordinator, Graham Rogers VK6RO at 22 Grace Street, Ferndale WA 6148, or phone (09) 451 3561 after hours for a free information package. Examples of intruders are found almost daily on 7.098 and 14.058 MHz, and that's just the tip of the iceberg. Of special concern at the moment is the CB-type activity from Indonesia on the low end of 40 metres, occupying spectrum which we amateurs should be using. Intruder Watch has had some successes recently, but your support is required for this to continue.

Repeater News

If you own a VHF handheld transceiver, have you ever thought how useless it would be without the fine network of repeaters we VK6s enjoy? Without a repeater, you could normally only communicate over a few kilometres, and even then signals would usually be poor. For a small fraction of what you paid for your 2 m transceiver, membership of the WA Repeater Group funds the maintenance of the repeaters you use. Your support will help the repeater network grow and enable you to get the most out of your VHF/UHF equipment.

WARG membership is just $15.00 annually. Join at this month's meeting on Sunday 20th November at the Hillview Scout Hall, on the corner of Welshpool Road and Gibbs Street, East Cannington. The meeting starts at 1.30 pm. Those unable to get to the meeting can post their cheque to Christine Bastin VK6ZLZ, WARG Membership Secretary, PO Box 425, Cannington WA 6107.

New members receive a handy state-wide repeater list, calendar and newsletter immediately on joining.

Divisional Broadcast Officer Wants News From You

If your radio club has done something new recently, or you've worked some rare DX, or set a new record on 10 GHz, or have any technical hints you wish to pass on to fellow amateurs, Broadcast Officer Tony VK6TS would like to hear from you. Phone (09) 244 2453 or post your news item to 23 Sabina Street, Woodlands WA 6018. If you have packet facilities, send your message to VK6TS @ VK6BBS.

"QRM" — News from the Tasmanian Division

Robin Harwood VK7RH

There have been two proposals for additional 2 metre repeaters within the State to service poor coverage areas. One has been submitted by the Central Highlands Amateur Radio Club (CHARC) for a repeater to be based at Arthur Lakes to serve the treacherous Lake and Highland regions. CHARC is a club that meets weekly on-air on Thursday nights at 1930 hours local time on 3.585 MHz.

Their Annual General Meeting was held on that frequency on 29 September. It sponsors the "Tassie Trout Award", which is only available on that net. One of the activities on the weekly net is a trivia quiz. But, to return to their proposal for a two metre repeater. There have been a number of instances where emergencies have arisen and communications have been difficult to non-existent on currently available repeaters, hence their proposal for a repeater which would be available for WICEN work.

The latest proposal has been announced by the "North Eastern Repeater Group", which has just been formed. Their plans are for a 2 metre repeater to be based at Tower Hill, near Fingal, to service the north east and have tone access to the 70 cm repeater VK7RAD at Mt Arthur. The Tower Hill site is not that far away from the existing Snow Hill site of VK7REC on 146.9 MHz and there seems to be an overlap in service areas. Whether the region needs two operational repeaters on the same band I'm sure will be discussed when the proposals are duly forwarded to the FTAC co-ordinator and then to Divisional Council.

September saw the death of two prominent VK7 operators. Max Ives VK7MX passed away in late August in Launceston. Max was a well-known 80 metre operator in the sixties and seventies and was often heard on AM working many ZLs. He was one of the first amateurs I heard, and eventually met, when I started out as an SWL. He worked in a grain merchant store in Devonport. In the 80s he moved to Cressy and then to Launceston, when his wife's health began to fail. In his later years, Max operated on the Launceston two metre repeater but wasn't able to successfully operate on HF from his restricted location.

Owen Langham VK7OL was also based at Devonport and was a regular on the daily "Sewing Circle Net" at 1700 hours local on 3.590 MHz. He was rushed to hospital and died after a heart attack. Many north western amateurs attended his funeral.

Incidentally, the annual "Sewing Circle Net" barbecue will be on again at "Rosybanyon", the QTH of Bill Donald VK7AAW. It is scheduled for 20 November. For further details check in on the "Sewing Circle".

Congratulations to Kevin Riley VK7NKR on passing his AOCP. In fact, he somewhat stole the show when he announced he was now VK7AKR at the September Northern Branch meeting. The meeting, which was held at the Australian Maritime College at Newnham, was a follow-up to the August lecture by Gary Hammond VK7KYZ on GMDSS, which included a practical demonstration. Thanks Gary for arranging the tour of the AMC. It certainly was an eye-opener to me to notice the changes there since we used to meet there in the 80s.

Meetings for the month of November are as follows:

Southern Branch: 2 November at 2000 hours at the Domain Activity Centre — VK7OTC.

Northwestern Branch: 8 November at 1945 hours Penguin High School.

Northern Branch: 9 November at 1930 hours Launceston Institute of TAFE Block "C" Level C Room 17.

Divisional Council: 19 November at 1100 hours at the Domain Centre.

That is all for this month. Don't forget if you have any news for inclusion in "QRM", you can forward it to me at VK7RH@VK7BBS or to my QTHR.

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How's DX

*Stephen Pall VK2PS**

As we are approaching summer and the sun is now on the southern side of the Equator, there is a slight improvement on the bands.

Late September and early in October, fortunately during the VK ZL Oceania SSB Contest, there were some good long distance openings to the rest of the world. Around 1200 UTC, Europe could be reached across the North Pole (DL, OH, G, ON, SP, YL, HL, and JA) and around 0400 — 0600 UTC, stations in 9K2, UA, UT, US, CP, LZ, 4L4, I, KH3, OK, and HA were worked.

The 15 metre band was open to Japan, Eastern Siberia and the West Coast of the USA around 2400 UTC and even 10 metres produced a few Japanese and USA contacts. Despite all this, the 10 cm solar flux moved between 71 and 74 during the whole of the previous week. Observation of the sun is a vital component in forecasting disturbances to the magnetic field and the ionosphere which, of course, affects the propagation in the HF spectrum.

In eastern Australia such observations are made at the IPS Culgoora solar observatory. This is located 25 km west of Narrabri in the north-west of NSW. Opened in 1978, the observatory operates from sunrise to sunset every day of the year. Continuous optical and radio observations of the sun are conducted. Regular reports of solar activity are issued to IPS in Sydney and to similar agencies world-wide.

The solar observatory's antenna farm would make a VHF enthusiast green with envy. The solar radio bursts are received by three antennas and fed into four spectrum analysers. A frequency range from 18 MHz to 1.8 GHz is swept through every three seconds, displayed on a computer and archived. A single antenna provides information about solar radio bursts at three discrete frequencies, 1.5 GHz, 2.7 GHz and 5.0 GHz. A simple whip antenna is used to monitor the quality of signals from distant shortwave transmitters to aid in the identification of disturbances in the ionosphere.

South Georgia DXpedition — VP8

South Georgia Island group, 53° 56' S, 34° 45' W, is located 1350 km east-south-east of the Falkland Islands and is administered by the Governor of the Falkland Islands. South Georgia was the centre of whaling operations dating back to the 1800s and by 1910 the whaling station Grytviken, located on the north coast, was producing 55,000 barrels of oil and had the distinction of having caught, in 1912, the largest whale ever, a 112 foot long blue whale which weighed over 100 tons. Some 500 men were employed in the catching season but, during the southern winter, the number of whalers was reduced to 30 to 100 men.

During the two World Wars the whaling company provided essential supplies to the British Government, particularly whale oil for edible fats and glycerin for explosives. Whaling ended at Grytviken in 1965 because the whale stocks had become fished out.

Al Hernandez WA3YVN (of VP8SSI fame) and WA4VQD have founded the SGI Expeditions Group. Al will lead a DXpedition to this much needed island in early January 1995 for a three weeks operation. The DX activity will be conducted from the now derelict Grytvinken whaling station. All the equipment, weighing 2500 lbs (four complete HF stations), was put aboard the research vessel Abel-J in Fairhaven, Massachusetts, USA during June. This is the same ship that transported the VP8SSI team to the South Sandwich Islands in 1992.

Al has permission to land at Grytvinken and obtained a special call for the expedition. The team will operate on all open bands with emphasis given to CW and low band operation. Frequencies to be used are as follows: CW — 1826, 3522, 7022, 10104, 14024, 18074, 21024, 24894 and 28024 kHz. SSB — 1845, (3785), 7065, 14195, 18145, 21295, 24945, and 28475 kHz. RTTY — 3580, 7040, 14080, 21080 and 28080 kHz. QSL via W4FRU, INDEXA, PO Box 5127, Suffolk, VA 23435, USA.

The group needs still one or two high calibre CW operators. The group is receiving good financial support from the DX community but the budget is $50,000 plus, and much more support is needed with the cost of the charter vessel, generators, food, travel, tents, etc. If you can help, please do so. Contributions may be sent to SGI DXpeditions, PO Box 2235, Melbourne, FL 32902, USA.

Oceanic Wanderings

In the absence of a major DXpedition, there is plenty of activity by smaller amateur groups and individuals travelling to various islands in the Indian and Pacific Oceans and the favourite area of individual DXers the Caribbean.

A Japanese group, sponsored by the Japanese "Five Nine" magazine, is on an island-hopping trip in the western part of the Indian Ocean to celebrate ten years of publication of the Magazine. The group consists of Mako JA10EM, Setsu JL1UXH, Ted JA1IDY, Chao JA1ETQ, and Toshi JA1ELY. Their tentative schedule is as follows:

- Mauritius Island 3B8, 14-22 Oct by JA10EM.
- Brandon Island 3B6, 23-24 Oct by JA1ELY, JA1ETQ, JA1IDY and JL1UXH.
- Comoros D68, 24-31 Oct by JA1ELY, JA1ETQ, JA1IDY and JL1UXH.
- Reunion FR, 25-30 Oct by JA10EM,
- Mayotte FH, 27-28 Oct by JA1ELY, JA1ETQ, JA1IDY and JL1UXH.
- Madagascar 5R8, 1-20 Nov by JA10EM.

Licences are in hand but callsigns are not yet known except 5R8HHP. Activity will be mainly on the low bands, WARC bands, CW, SSB and RTTY. No QSL manager has been announced yet.

Members of the Southwest Ohio DX Association will be active from St Lucia

The Malus Island DXpedition VK6ISL shack. Mike VK6BHY pays a surprise helicopter visit.
(Photographs by VK6LC and VK6BHY).

J6, for two weeks from 22 Oct to 5 November. A special contest station will operate during the CQ WWDX SSB Contest from 29-30 Oct. QSL manager for the Contest station is N9AG. Outside the contest individual callsigns and separate QSL routes will be used.

Another group of US amateurs will operate from St Marten from 25 Oct to 1 November. During the contest they will activate the callsign PJ8Z. Operators will sign PJ7/ before and after the contest. QSL to KA9FOX.

Turks and Caicos Islands VP5 will also be activated around that time by Tom K2TD, Jack N2VW and Mike WB2YOF using a re-issued callsign, VP5R. QSL VP5/call via home calls, and VP5R via N2VW.

Dieter DL3KDV will be on St Lucia J6 from 9-17 Nov, on St Vincent J8 from 18 Nov to 1 Dec, and on Dominica J7 from 2-12 December.

DXAC News

The ARRL, in its DX Bulletin No 52 issued on 24 August, has announced the DXAC (DX Advisory Committee) vote results.

a. The Committee rejected the proposed revision or alteration to Section 1.10 of the DXCC Rules which states that all contacts must be made by the same station licensee. However, contacts made under different callsigns are allowed provided the licensee was the same person and the contacts were made from the same DXCC country.
b. The DXAC rejected a petition for a new DXCC country status for the Turkish Republic of Northern Cyprus.
c. The advisory committee has ruled also about a minimum size for new DXCC countries. The DXCC recommendation says a DXCC country shall be a natural landmass of a size adequate to support a reasonable amateur radio operation. In the case of islands, the surface shall be dry at all times during high tide, and the physical characteristics may not be changed or modified. This includes the use of man-made operating structures. Each case will be judged on its own merits. Implicit in the recommendation is that operation from an island must take place from the surface of that island. The minimum size recommendation now goes to the Awards Committee for action.

* North Korea — DXCC decision. A DXCC news release dated 29 August says the following:

In response to the continued questions concerning the P5RS7 operation of December 1992-January 1993 the following is provided. While reviewing the original documentation and photographs, DXCC staff noted some apparent discrepancies. DXCC staff then requested some additional information. After more than one year, additional information was received. During that year the ongoing investigation into the paperwork and photographs suggested that the operation may have taken place from another location. Documentation in support of P5RS7 accreditation did not establish that operating permission had been granted by appropriate authorities, nor did it establish that the operation took place from the territory of North Korea. After reviewing all available information; there will be no DXCC credit for the P5RS7 operation and the file has been closed. This determination is based upon Section I.7 and 12 of the DXCC rules.

The Malus Island DXpeditioners (l to r) John VK4JWG, Dave VK6DLB and Mal VK6LC.
(Photographs by VK6LC and VK6BHY).

Incidentally, Romeo 3W3RR visited the Huntsville, Alabama Hamfest during the weekend of 21 August but was silent about the P5RS7 and 5A0RR activity. He was at the DX dinner and spent a lot time chatting with DXers all weekend. According to Tim KJ4VH, he did tell at least one DXer that he plans to take a couple of years off from DXpeditioning.

Principality of Seborga

It looks like the tale of this "independent country" will never end. As time goes by, it appears more and more to be an effective tourist publicity stunt for this north-western Italian township near the French border between the frontier railway station of Ventimiglia and the next station to the east, Bordighera. Two and a half years ago, when I was travelling on the train between the two localities, I had not the faintest idea that I was passing near a "future DX" country, otherwise I would have interrupted my journey to visit the place. Incidentally, the countryside there was not very appealing.

Here now is the latest news (gossip?) about this "principality". You will have to be the judge of the validity of all these claims, but please suppress your QSLing desires for the time being. To find Seborga on the map you look at the coordinates 43° 49' N and 07° 38' E. My Macquarie Illustrated World Atlas failed to produce a locality with that name. It is possible that Paul I1RBJ will present more details, information, and slides about Seborga at the RSGB 1994 International HF and IOTA Convention to be held from 7 to 9 October. The "principality" celebrated its foundation day on 28 August and a number of foreign amateurs were given permission to operate with their home call followed by an additional suffix of /IP. It is now also known that Paul I1RBJ is the only person who can issue an operating licence in Seborga on behalf of the "Prince of Seborga", Georgio 1, who told his people that the principality is going to be recognised world-wide "soon".

The new rules of the principality are ready and the population of about 300 will be able to vote on it soon. The Knights of the Crown (10) were appointed and Paul I1RBJ was among them. A decision from the International court at The Hague on the matter of full independence from Italy is expected soon. Seborga claims that this independence was never lost despite the Treaty of 1748 when the Principality remained free of the influence of Genoa and later of that of Savoia, the Kings of Italy and from the Italian Republic. Paul says that he will take the necessary documentation direct to the ARRL in September for the DXCC status of Seborga.

Contrast all the above "good news" with the "bad news" as published in issue 755 of *"The DX Bulletin"* in a short article penned by Mario Ambrosi I2MQP. Mario

writes "The Kingdom of Seborga exists only in the mind of someone that suffers the high temperature, and this year in Italy it was very hot during August. Seborga people pay taxes to Italy, they have a Mayor that is part of the Italian state, they have their Italian police, they use Italian stamps and Italian money, they have a normal post office like every small village in Italy. There is nothing like a Kingdom of Seborga". Mario further says that "Paul I1RBJ, some years ago, declared that he went to 701 on a DXpedition. Later the 701 Telecommunication administration said that they did not authorise the proposed activity and that he (Paul) did not go to 701 at all. This was published in the ARI (Associazione Radiotechnica Italiana) magazine. I1RBJ is not a member of that association anymore", concludes Mario in his unfavourable comment on Paul, who apparently plays an important part in the affairs of Seborga. Just stay tuned, I will keep you posted.

The North Island (IOTA OC-198) DXpeditioners (l to r) Mal VK8LC and John VK4JWG with a HF6V-X Butternut vertical antenna. *(Photograph by VK8LC).*

Future DX Activity

- Gus 9Q5TE has returned to Zaire and is active again. QSL to SM0BJF.
- JT1CS is active on 20 metre CW. QSL to Bat Erdene, Box 125, Ulan Bator 20, Mongolia.
- Kab 8J1RL was reported to be active on 20 metre CW from Antarctica.
- John GM0FQV will be in Ghana for the next couple of years. He is now using the call 9G1JB. QSL to G4XTA.
- Phillippe F5PHW will be back in Djibouti from the end of October to 15 December. He will try to regain his former call J28BS, under which he operated two years ago. Most of his activity will be on CW on 10 to 80 metres, including 30 metres. QSL to F5PHW via the Bureau or direct to Phillippe Berger, 24 Lot Labracat, 30800 St Gilles, France.
- Ernesto HR1ERL will be signing HQ1T until the end of November and he will be active on several nets. QSL via HR1FC.
- Paul WF5T will be active from Uganda as 5X1XT during November on 80 to 10 metres. QSL to his callbook address.
- There is a possibility that John PA3CXC will be active during October and November from Angola.
- Laurent F5IXR will be active from Chad until Christmas. He hopes to use the call TT8XR.
- CT1CZT begins a two year tour of duty in Sao Tome S9 and hopes to be active soon with an S92 callsign. QSL to CT1ADP, Horacio Goncalves Torres, PO Box 2676, Lisbon 1117, Codex, Portugal.
- John G8XFT is going to the Falkland Islands to Mt Kent and will be active with the callsign VP8CQJ from 18 October to 20 February 1995. He will operate on all HF bands on SSB, AMTOR and packet.
- Pierre F5NLL, who operated from Kergulen Island as FT5XJ, advised me that he returned to Kergulen around the middle of October and will be active until 15 December. After a Christmas holiday break in France he will be active again from January to March 1995. He had a computer problem with his log which has been solved and the first batch of 500 QSL cards has already been posted.
- Dick K2UFT will operate as ZF2SY on the low bands (40 and 80 metres), primarily on CW, from 19 to 23 November from 0300 to 0600 UTC and 1000 to 1400 UTC. QSL to his home call.
- Raph DL2FDK will be active as HS/DL2FDK from 9 December to 9 January 1995, on SSB, PACTOR and RTTY.

Interesting QSOs and QSL Information

(Note: Contact made from Australia, E = East Coast, W = West Coast, M = the rest of the Continent.)

- ZC4JB — John — 14205 — SSB — 0627 — Aug (E). QSL to the ZC4 Bureau.
- TT8/F5IXR — Larry — 14200 — SSB — 2050 — Aug (E). QSL via F5MXH, Thierry Gauthier, 58 Rue de la Poste, F-42240, Marcilly en Vilette, France.
- D44AB — Daniel — 14215 — SSB — 2150 — Sep (E). QSL to Daniel Lima Tavares, POB 166, Praia, Cape Verde, Africa.
- 9G1MX — Shalom — 14227 — SSB — Sep (E). QSL via 4X4MS Shalom Melzer, POB 445, Givatayim 53408, Israel.
- FM5DP — Victor — 14224 — SSB — 0652 — Sep (E). QSL to Victor D Louisy, Fonds La Haye Voie NX8, F-97233 Schoeicher France.
- 4L7C — Mero — 14307 — SSB — 0633 — Sep (E). QSL to The Manager, PO Box 97, Tbilisi, Georgia.
- H23W — 14176 — SSB — 0517 — Sep (E). QSL to 5B4WN, Marios Nicolau, POB 4834 Nicosia, Cyprus.
- 9A9OOPAX — Sam — 14199 — SSB — 0622 — Sep (E). QSL to HRS QSL Bureau, PO Box 564, Dalmatinska 12, HR-41000, Zagreb, Croatia.
- T30XP — Peter — 7083 — SSB — 0702 — Sep (E). QSL to Peter Dalton, PO Box 72, Bairiki, Tarawa, Republic of Kiribati.
- P39P — 14223 — SSB — 0506 — Sep (E). QSL to 5B4ES, English School Radio Club, Nicosia, Cyprus.
- LU4FM — Tony — 7067 — SSB — 0707 — Sep (E). QSL to Radio Club Rosario, Box 263, 2000 Rosario, SFE, Argentina.
- GU3EJL — Stan — 14227 — SSB — 2150 — Sep (E). QSL to Stan Green, PO Box 9, Chartridge, Valongis, Alderney, Guernsey, Channel Islands.

From Here There and Everywhere

- The callsign 8N3ITU was used in connection with the ITU Conference in Kyoto, Japan. Contacts will be automatically acknowledged via the JARL QSL Bureau.
- From 1 September to 31 December stations in Belgium will be authorised to use the special prefix "OS" to celebrate the 50th anniversary of the liberation of Belgium.

- BV5Y is the first club station in Taiwan at the Headquarters of the Chinese Taipei Amateur Radio League (CTARL). QSL to their Bureau, PO Box 73, Taipei 100, Taiwan ROC.
- Colombian novices (HJ) are now allowed SSB privileges on 10 and 15 metres as well as 40, 80 and 160 metres.
- Pete VQ9TP is on seven bands doing a lot of CW, usually between the hours of 1230 and 1630 UTC. QSL to his home call N5TP.
- Apollo SV2ASP/A is now active on digital modes, RTTY, Amtor and PACTOR. Equipment was donated by DK0EE, DF5SR and many others.
- Tom VR6TC has returned to Pitcairn Island after receiving medical treatment in New Zealand.
- If you worked David T30DW (formerly VK2GQL), send your card to David Olley, PO Box 66, Bairiki, Tarawa, Republic of Kiribati.
- Selim OE6EEG has decided that, as from 1 October, he will cease to be the QSL manager for the following stations: A71AL, HZ1MM, SU1AY, SU1ER, SU1RR, YI1DZ and 7Z1IS.
- When Mark Loveridge VK0ML was on Macquarie Island three years ago, he was the only scientific officer in his group. This left him little time for amateur radio. His callsign was constantly pirated. When he realised this, he QSLed every contact in his log via the Bureau. So, if you have not received your card via the Bureau by now, you obviously worked a pirate.
- The special event station VK2WAH, activated by the members of the Wahroonga Amateur Historical Radio Association, was on the air for 24 hours on 22 September, celebrating the 76th anniversary of the first direct wireless message from Wales, United Kingdom to Wahroonga, Australia. A special QSL card will be posted in reply to all cards received. Send your SASE to The Manager, WAHRA, PO Box 600, Wahroonga, NSW, 2076.
- Graham VK6RO kindly sent me a photocopy of the cover of the August issue of CQ Ham Radio Magazine (Japanese edition). The photo shows a piece of rock big enough to accommodate four amateurs standing in water, holding on to a metal scaffolding about three metres high, on which there is a small metal platform accommodating one generator, a fold-up picnic table, and with Martii OH2BH/VR2BH sitting at the table in the operating position with a transceiver, and another DXpeditioner standing. There is a vertical antenna attached to one of the platform legs, whilst a PRC flag flutters in the wind. Yes, you have guessed right. It is the picture of BS7H, Scarborough Reef, which is just a pile of rocks.
- In reply to those who inquired about joining INDEXA (International DX Association Inc), send $US15.00 for a yearly membership fee, together with your name, callsign and address to INDEXA, PO Box 607, Rock Hill, SC 29731, USA.
- If you worked XQ8ABF, he was Alex CE8ABF working from Tierra Del Fuego (IOTA SA-08). QSL to PO Box 28, Punta Arenas, Chile.
- Have you heard of the Young Operators' International Radio Club? This Club intends to bring young hams and SWLs together through radio communications and a newsletter. For future information contact the club's secretary Lee Volante, G0MTN, 200 Longmore Road, Shirley, Solihull, West Midlands, B90 3EX, England.
- Since 1 September 1994, Brazilian amateurs are permitted to operate on the 30 metre band between 10138 and 10150 kHz.
- If you QSL direct to Nepal or to Iraq, do not include "green stamps" in your QSL requests, only IRCs.
- Are we in for a prefix callsign change? The Western Carolines of Palau (or Belau to others) gained full independence on 1 October. It will be interesting to see what will replace the KC6 prefix.
- There was some reconstructing of callsigns also in Slovakia. The OM3 and OM4 callsigns have now been derestricted. Do not be surprised to hear prefixes from OM1 to OM0 in the future.
- Is this a breakthrough? JA1UT, JR0CGJ and G3NOM demonstrated amateur television in Yagon (formerly Rangoon), the capital city, to the Myanmar government authorities. The activity took place over two days in the early part of September. The callsign XY1HT was used, and contacts were made with seven countries on SSB and SSTV modes. The Government officials are studying the possibility of using amateur radio as part of a future government project.
- Hartmut 9X5HG (see *Amateur Radio* Aug 94 issue) was reported to be active. He was heard at 2000 UTC on 21 September working CW on 10103 kHz.

Sea voyage to North Island. Mal VK8LC and members of the Jupiter family, Martin, Craigie, traditional landowner and skipper Alan and, in the backgound, daughter Stephanie.

(Photograph by VK8LC).

QSLs Received

NH2K(3W op) — FW/AA6LF (3W AA6BB) — BV2BI (4W op) — EA6NB (4W op)- C53HG (3W W3HCW) — TU4EI (3W W3HCW) — TR8JH (3W W3HCW) — P29VH (2M VK4CRR) — 6W6JX (4W op) — EA8/WA1ECA (3W op) — C31HK (4W op).

Thankyou

Many thanks to the contributors to this column. Your help is greatly appreciated. Special thanks to VK2KCP — VK2KFU — VK4AAR — VK4CRR — VK4MZ — VK4OD — VK5AHI — VK6RO — F5PHW — FT5XJ — WA3YVN and the following sources of information, *QRZ DX, The DX Bulletin, The DX News Sheet, The W6GO/K6HHD QSL Managers List* and *IPS Radio and Space Services.*

73 and Good DX.

*PO Box 93, Dural, NSW 2158

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FTAC Notes

*John Martin VK3KWA, Chairman, Federal Technical Advisory Committee**

2.4 GHz Band Plan

Thanks to those individuals and groups who have taken the time to help with comments and information. Some very helpful suggestions have been received and further changes will be made. I have written to all those who responded to my original request for comments. The final version should not take much longer.

1.2 GHz Band Plan

Very few responses have been received so far, and any would be appreciated. We aim to please, as they say, but it is difficult when people do not make their views known.

Mr Ed Williams, Chief Engineer (Surveillance) of the Civil Aviation Authority, has advised that the remaining 1275 MHz radars should all be phased out by the end of this year. The Authority has no objection to amateurs operating in the 1270-1280 MHz band in areas where the radars have already closed (at the time of writing, Melbourne and Canberra only).

The letter from the CAA also stated: "The Authority notes the spirit of co-operation which has ensured that interference to these Air Traffic Control radars has been minimal and would like to commend the Wireless Institute of Australia for its self regulation and restraint. We would also like to wish your experimentation in this field of electronics continued success in the future."

80 Metre DX Window Again

In direct contrast to the above, earlier warnings about the band limits of the 80 metre DX window have been ignored and most stations are continuing to operate out of band.

RIB71 states that all emissions must be contained within the band limits, in this case 3795 to 3800 kHz. An LSB signal extends almost 3 kHz below the suppressed carrier, therefore the carrier frequency should be no lower than about 3798 kHz.

It is amazing that so many amateurs have either not read the rules or do not seem able to understand basic concepts such as the occupied bandwidth of an SSB signal and its relationship to the carrier frequency.

The WIA will make a submission for an extension of the window in the near future. It would be in everyone's best interests to prove that Australian amateurs are capable of abiding by the regulations.

New ACT 70 cm Record

A contact between Chris Davis VK1DO, and Roger Bowman VK5NY, has broken the previous ACT record held by VK1DO and VK2DVZ. The contact between Chris and Roger was on 5/10/1993 and the new record distance is 951 km. Congratulations.

**PO Box 2175, Caulfield Junction, VIC 3161*

Pounding Brass

*Stephen P Smith VK2SPS**

As a result of a letter received from Mr Allan Moore of the Sydney based Morsecodians Fraternity, the two part series on the history of the 8043-44 IC Chip will now appear in the December and January issues of *Pounding Brass*.

Allan Moore's letter was about the highly successful events which took place in early April of this year, the 140th Anniversary of the official opening of the first Telegraph Circuit in Australia. The following is an extract from that letter:

"On 7 and 8 April, 1994 former telegraphists and Postal Clerks converged on the venues — Melbourne and Williamstown in Victoria, and Canberra in the Australian Capital Territory — before 9 am on the first morning, ready to participate in the re-enactment. (The following evening, at the get-together reunion, the old operators and some family members numbered about 185.)

"The Melbourne GPO (owned by Australia Post) and the Williamstown Historical Museum were set up identically. Two beautifully restored sets of sounders, with keys, relays, and Cathedral galvanometers secured on special rosewood bases for the occasion, were at both circuits. In Canberra, 400 miles away, they had similar equipment but permanently mounted on a specially prepared telegraph operating table which was used throughout the year in the National Science and Technology Centre. Telecom Australia provided the telegraph lines and loaned us, from their historical collection at Collingwood, early Western Union piano style transmitters, original tape readers and transmitters of the day, plus keys and relays.

"These were on show at the venues, and were supplemented by quite a number of hand-type, as well as semi and fully automatic Morse keyers (bugs) owned by Morsecodian members. Three sets of eight posters, nicely produced by the Government Printing Office in Canberra, were at each venue. Five of the posters gave a brief, simple explanation of how a telegraph system worked. The sixth poster featured photographs and explanations of some of the equipment in use; the seventh featured a reproduction from the Victorian Colonial Gazette of 2 August, 1853 inviting tenders for the construction of the line between Melbourne and Williamstown; and the last poster was an enlarged copy of a South Australian Colonial Gazette Notice of April 1897 in which the Post Master General of South Australia (Sir Charles Todd of Overland Telegraph Line fame) issued instructions that the Morse alphabet and allied signals depicted on the poster, were to be learned by all Morse operators by the end of June 1897 and used on all circuits.

"This was the introduction to all Australian Colonies of the continental or International Morse which is used to this day. (Prior to this there were several codes operating in Australia, the principal one being the American Morse code that was used from the commencement of the first circuit between Washington DC and Baltimore on 24 May, 1844.)

"At 9 am on the first day the signals went out .-- .-- .-- -- Melbourne calling Williamstown. The identical signals from the original American Morse Alphabet of 1844 which are, coincidentally, the very same as in the International Code used today. During the two days of operations over 700 telegraph messages were handled between the three venues for members of the public, without charge. The messages, once transmitted, were received by ear and transcribed on to old typewriters using specially printed telegraph forms and envelopes for the occasion. We endeavoured to make the forms look as authentic as those used back in the mid 1850s with reasonable success.

"Crowd participation was good in Victoria, and very well attended in

Canberra. Canberra was manned by three former telegraphists, the balance of available Morsecodians living in the area having come to Melbourne. Participation by former Melbourne telegraphists, postmasters, postal clerks and other persons interested in Morse, was extremely good and dozens of former operators tried their hand at sending and receiving again. Amateur radio operators were well represented among the throng, as well as a dozen or so former Antarctic radio operators now holding ham tickets.

"At the conclusion of our two operating days, and after all the equipment was packed up, we attended the API/Telecom Building at 441 Lonsdale Street, Melbourne for our re-union function. The gathering attracted old operators from a number of Australian States, some of whom had not seen each other for nearly sixty years.

"We achieved the aims we had set. We enlisted and received generous support and help from our sponsors. We set up operational Morse links between the three venues with authentic, working telegraph equipment and exchanged traffic for two days. We used our old sending and receiving skills. We re-established the great enjoyment that Morse operators had for their former vocation, and our younger telegraph colleagues and friends who had not learned Morse, joined in with great gusto and enjoyed the camaraderie we all held for each other. And this was further cemented at the get-together on the evening of Friday, 8 April. Nearly fifty Melbourne operators joined the Morsecodians Fraternity on the night, and further members are very welcome.

"But, most importantly, we honoured Samuel Morse and like-minded inventors of the day, our own colleagues of yesteryear, and the difficulties they faced in the years to follow. In spite of these difficulties, Morse communications proliferated in the old Colonies and endured for 140 years. They spanned a continent not much smaller than the contiguous United States of America, and created a breed that will never exist in those numbers again. And finally, in 1872 with the opening of the Australian Overland Telegraph, one of the greatest construction efforts that Australia has known, we were able to speak to the world."

I would like to thank the President of the Sydney Morsecodian Fraternity, Gordon Hill, Allan Moore and committee members on a very successful event and one to be extremely proud of.

Who said telegraphy is dead?

*PO Box 361, Mona Vale NSW 2103

An Old Timer Reflects....

Des Greenham VK3CO continues to look back over 50 years of amateur radio operation.

The station I was in contact with suggested we shift frequency and "go to 14.147". This I did and there he was waiting for me, all so easy and so precise.

Upon reflection, I recalled the old days before the war (WW2) when we all used crystal locked transmitters. VFOs as we know them today were unheard of. We all had our favourite spot on the band set by our crystal. Perhaps if we were more affluent we might have had more than one crystal in our possession!! To change our spot on the band we would physically remove the crystal from its holder and replace it with another.

Of course, in those days, we always used two frequencies for a contact. We would call CQ on our spot and then announce that we would "tune the band". It was customary to always check on your own frequency first and then tune the rest of the band looking for an answer. It must also be realised that the transmitter was entirely separate from the receiver and usually was a very large and impressive unit. It was located on the floor of the shack and stood 6-8 feet tall and was adorned with meters and switches. Of course, it was home built. There was no alternative.

The transmitter was controlled by a switch on the operating table which was arranged to place the receiver on standby, relay switch the antenna, and then switch on the high tension. It must be appreciated that the transmitter used valves and high voltage in the range of 1000-2000 volts DC. In those days the maximum power allowed was 50 watts DC input to the final valve. The output was up to you and depended on the efficiency of your equipment.

We had no SWR meters. These came a long time after the war. We obtained our impedance match by adjusting for maximum power output into the antenna and results proved how good a match we had achieved. This was all on AM (amplitude modulation) and we all took a great deal of pride in transmitting a good quality signal.

Today it is all so easy and efficient. We can go to the exact frequency, we have little or no control of our audio quality and it is all in a small black box on the operating table and costs a fortune!!!

(*Sadly, Des joined the Silent Keys early in October at the age of 72. He had supplied us with ten instalments for this column, which we will continue to publish until all are used. We are sure Des would have wanted it that way. Ed*) **ar**

Repeater Link

*Will McGhie VK6UU**

FM 828 VHF Simple Tune Up

What follows is a simple tune up of an FM 828 VHF transceiver. It only relates to those parts of the radio that are required to re-tune the 828 from its commercial frequency to the 2 metre amateur band. It is not usually required to touch the IF line up as this does not change from its commercial use to amateur use. In a later article in Repeater Link I will discuss the complexities of lining up a FM receiver in detail.

Receiver — TP1

TP1 is located on the receive board near TR2 and the large 10.7 MHz IF crystal filter. Place a Micro-amp meter between it and pin 9 (10 volts regulated). Tune C75 and C76 for maximum reading of about 65 μA. These two capacitors tune the receive local oscillator multiplier. Failure to peak these tuned circuits indicates there is no local oscillator injection into the mixer. If so, there is no point in going on as, with no local oscillator, the receiver will not work.

Next tune the four front end RF tuned circuits L1, L2, L3, and L4 for best quietening on a weak signal. If you do not have a signal generator then an off air signal, or the fifth harmonic from a 10 metre transmitter, may be used. Terminate the 10 metre transmitter into a dummy load and place an antenna wire from the FM 828 close to the dummy load. Adjust the 10 metre signal for a noisy signal and tune L1 to L4.

There is no "S" meter output on an FM 828 so sensitivity adjustment has to be done by ear for best quietening.

Finally, adjust the receive crystal netting to put the FM 828 on frequency. L7, L8 and L9 each adjust one of the crystal oscillators on frequency. If you have only one channel, and the crystal is in CH1, then adjust L7 for best audio.

Adjustment of the IF is usually not required. If you delve into the tweaking of the IF be warned that it is best left alone unless you know what you are doing.

One final point on the receiver. Be sure of the IF frequency before ordering crystals. The FM 828 has two versions of

IF, 10.7 and 10.8. Open the transceiver and look at the IF crystal filter to find out which version you have.

The receive crystal frequency = F-10.7 or 10.8, divided by 3. Most crystal suppliers only require the make, model, receive frequency and IF frequency, so there is no need to work out the actual crystal frequency. If you do not specify the IF then 10.7 may be assumed and, if you have a 10.8 IF, then your receiver will be 100 kHz low.

Exciter — TP1

Place an SWR meter and 50 ohm dummy load on the antenna socket to monitor the transmitter power.

In transmit mode adjust L4 and L5 for maximum voltage at TP1 (about 2 volts). These two coils are the phase mod coils and pass the transmit crystal signal to the PPL IC, IC1. This is also where the transmit audio is applied to L4 and L5.

Exciter — TP2

Adjust L8, the VCO frequency adjust, so that TP2 reads 5 volts. It is best to wind the slug to the top and then wind it in, watching TP2. This adjustment can be misleading at times as there may be two 5 volt points. The first, on winding the slug in, is not the correct one. Keep winding the slug in until another 5 volt point is reached. Usually, before the correct 5 volt point is reached, the VCO will lock and there will be RF power output. Once the VCO is locked to the crystal reference the Tx Red LED should come on when the PTT is operated.

There should now be some 2 metre signal on the required channel and there may be enough to register on the power meter. If not, wind L6, near L8, in and out looking for some power output on the power meter. L8 is broad and placing the slug in the middle should be near enough.

If there is still no output on the power meter, listen to the 2 metre signal on another transceiver to see if you can hear it. Adjustment of the PA is next. Without some power indication on the power meter this can be tricky. Slight adjustment of the tunable capacitors in the PA can be tried, probably increasing the C slightly on each one while watching the power meter. As soon as any indication is seen on the power meter then peak each tuning capacitor in the PA module.

As power modules are usually broad band and there should be some power output as soon as the VCO is locked, much of the above should not be needed.

Peak L6 on the exciter board (broad).

"Net" the crystal reference coil for the correct transmit frequency, for each channel you have installed, L1, L2 and L3.

Transmit crystal frequency = F divided by 8.

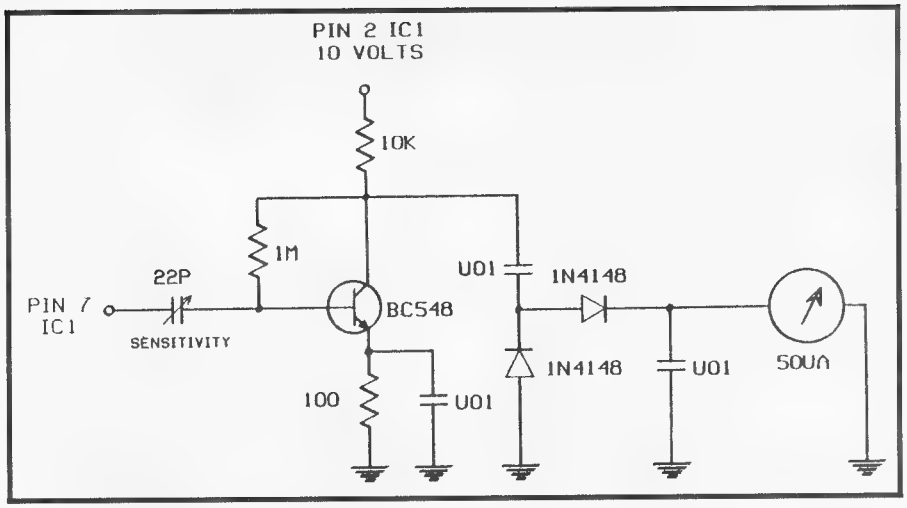

Fig 1 — FM 828 A Band S-Meter.

FM 828 S-Meter

The only shortcoming of the FM 828 is the lack of an S-meter as a test point. When building and servicing repeaters, an S-meter is a valuable tool. Frustrated by this omission I set about looking at providing an S-meter output. This is not easy on the FM 828 due to the difficulty in finding the right point. The IF strip has two ICs, neither of which has a DC output proportional to RF input level. The input to IC1 is too low in level to operate an S-meter. The output of IC1 (pin 7) was the only point I found of any use. There is some limiting on stronger signals in IC1 above 5 μV so the S-meter circuit shown is full scale at about 5 μV.

IC2 limits almost any signal level so no RF variation could be found with changes in input level on any pin.

The resulting circuit (see Fig 1) is simple and provides a range of about half a μV to 5 μV. If any one has a better circuit, or can improve on this one, please let me know.

29 MHz FM

As at the middle of September there is no word on allowing 29 MHz simplex gateways. Our local WIA president has made inquiries but, due to people being on holidays or not available at the time of the phone calls, no news. The situation is in the hands of the Federal WIA and, as time permits, is on the agenda for discussion.

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VK6UU @VK6BBS

Amateur Packet World

*Grant Willis VK5ZWI**

Packet Basics

This month, following some correspondence to the Packet Doctor, I thought I would take a look at some very basic aspects of packet operation. Things like how to connect a TNC to a computer and radio, what software is available, and some of the aspects of optimising your packet station.

TNC to Computer Connections

When operating packet radio, most people use either a TNC (Terminal Node Controller) or a modem and a software TNC emulation to generate the packets. The connections required are fairly simple and, while I don't attempt to present the exact pin outs for every different type of radio/TNC/Computer combination, the following basics will give you a guide. Further information can normally be found in most TNC manuals and some of the packet publications.

Connecting a TNC to a computer and radio is relatively simple. In the case of the IBM-PC or PC-Clone computers the TNC talks to the computer using a serial cable which you can either purchase or make yourself. The main control lines in this cable are as shown in Table 1.

Each of these signals is either an input or an output, depending on whether it is on a computer terminal or the TNC/Modem.

These lines appear on different pins depending on the type of plug in use. The

Table 1 — Serial cable connections

		9-Pin	25-Pin
TX Data	Transmitted Data Signal Line	3	2
RX Data	Received Data Signal Line	2	3
Ground	Signal Ground	5	7
RTS	Ready To Send (Flow Control)	7	4
CTS	Clear to Send (Flow Control)	8	5
DSR	Data Set Ready	6	6
CD	Carrier Detect	1	8
DTR	Data Terminal Ready	4	20

serial ports on a TNC and computer can be either both 9 pin, both 25 pin or a mixture of both sizes. Table 1 shows the pin outs on the RS-232 connector. On this cable the TXD, RXD and Gound pins are fairly self explanatory. The RTS and CTS lines are used by the TNC and computer to control how much data is sent at any one time between the computer and TNC. This prevents any overflows and lost data which could occur if there was no control and a block of data larger than the TNC or computers buffer was sent. Using all of the pins results in a circuit diagram as shown in Fig 1 and Fig 2.

Connecting the TNC to the computer in this way gives you the capability of operating the serial connection in "hardware flow control" mode, which means that it is through hardware and signals on separate control wires that the flow control is achieved. To activate hardware flow control on your TNC you may need to enter a command similar to "XFLOW OFF". Consult your TNC manual for more information.

Connections between TNCs and other types of computers may be similar if they use RS-232 type connections and serial ports. If your computer does not have an RS-232 port then you should read your TNC manual carefully as well as your computer's manual. The principles will possibly be similar. If you are still puzzled, try contacting your local radio club. There may be another local amateur who can help you.

If you are using a modem with a software TNC then the connections will be different and you should look at the documentation for the particular program you are using.

TNC/Modem to Radio Connections

Connecting your TNC or modem to a radio can take several forms also, depending on what type of radio you are using. The four basic connections required are:
Transmit Audio (Microphone Input);
Receive Audio (Speaker Output);
PTT (Push to Talk — keys the transmitter); and Ground.

On most radios all four of these can be found on the microphone socket. In cases where this is not the case, the speaker audio can most likely be found on a jack at the rear of your set. You should connect your TNC/modem and radio as shown in Fig 3.

If you are intending to use a hand-held instead of a normal radio, the connections are a little different. Hand-helds often combine the PTT and Transmit Audio onto one input. In this case you need to wire your modem to your hand-held as shown in Fig 4.

The values of the resistor and capacitor will depend on the impedance of your hand-held's input as well as the TNC or modem's output. A starting point is around 10 kΩ and 0.1 μF. The value of the resistor, in particular, may require some experimentation, depending on the particular hand-held you are using.

These are all just examples. Each radio and TNC is slightly different and you will need to consult the relevant handbooks for your particular equipment to find out what is required, but the basics will always be the same.

*GPO Box 1234 Adelaide 5001

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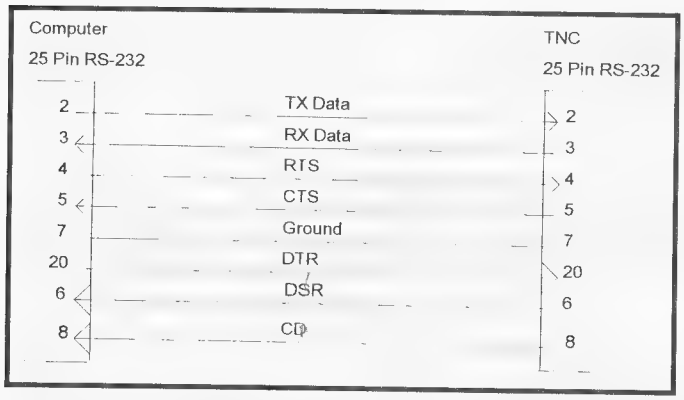

Figure 1 — Computer to TNC — 25 pin connections.

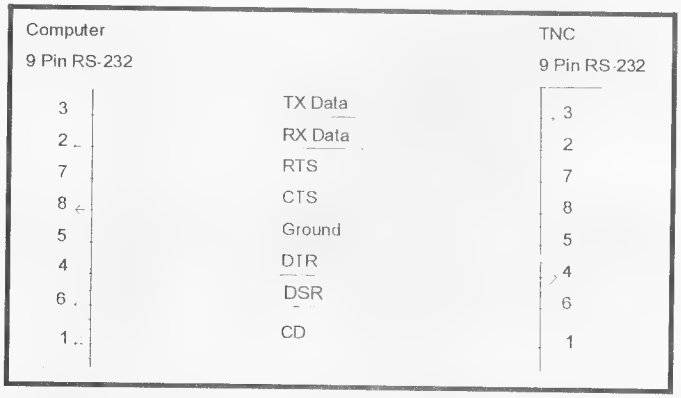

Figure 2 — Computer to TNC — 9 pin connections.

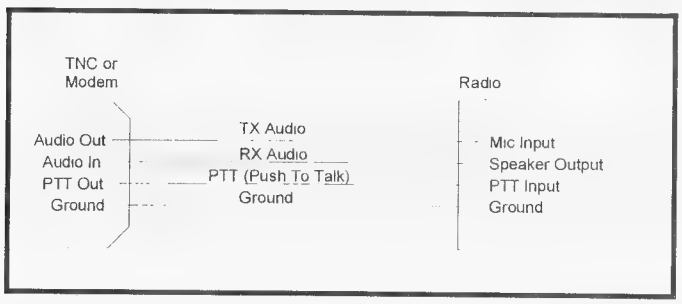

Figure 3 — TNC/Modem to radio connections.

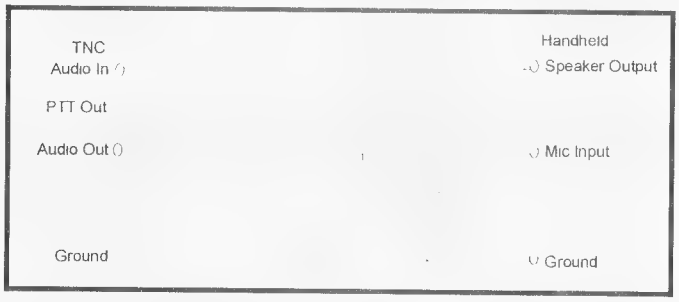

Figure 4 — TNC/Modem connections for a handheld.

International Amateur Radio Union Monitoring Service (IARUMS) — Intruder Watch

*Gordon Loveday VK4KAL**

My notes have been taken this month from the Region 3 Monitoring Service News.

The Ninth IARU Region 3 Conference in Singapore was an interesting exercise. One of the important resolutions to come out of it was the unanimous vote supporting *"This Conference authorises the IARU MS Region 3 Co-ordinator to publicise both those countries which breach the Radio Regulations as well as those countries which take positive steps to cease such breaches".*

The Indonesian problem seems to arise simply because of people not being aware of the regulations and sometimes because of different interpretations of same. Administration appears to be a major problem. There are many thousands of islands to cover. We have, however, "a man on the spot". This means we want specific reports to pass on. Our man in India has sent his first report in, so our problems there should be able to be minimised!

I invite any Short Wave Listener (SWL) to join our ranks. It is a good step to becoming a licensed operator. The Co-ordinator in India came from SWL ranks, and has only recently been licensed. I congratulate him on both counts.

I also need as much input as possible from VRQ and company, as we also have a person with "an ear and, possibly, voice" to the Government people in that country. I also am on the lookout for any reports on amateur beacons.

Now something to gladden your days. Owing to the poor conditions experienced above 20 metres, more pressure from commercial interests to encroach into our band space is becoming evident. Many amateur operators in our region have begun to act aggressively toward these unwanted intruders by directly challenging them or by using CW tones to interfere with their transmissions. In many instances these actions have resulted in the intruders leaving to find other frequencies. Indonesian based intrusions are most frequently reported, followed by commercial fisherman speaking Japanese and Taiwanese. **IF YOU DISCOVER ANY OF THESE INTRUDERS OPERATING IN YOUR NORMAL AREA OF THE BAND, MAKE YOURSELF KNOWN AND CHALLENGE THEM. IF THEY CANNOT COMMUNICATE, THEY WILL PROBABLY LEAVE FOR ANOTHER FREQUENCY.**

Now the not so good news. The ITU International frequency list for Regions 1, 2 and 3 has 38,867 registrations for 3.500-3.700 MHz; 7,455 for 10.100-10.150 MHz; and 821 for 14.000....14.350 MHz. So, if this is not a good reason to become an active observer, I don't know what is? You will note these frequencies cover our amateur bands. They are open to commercial interests if we do not use them, make no mistake about that. Expect some more activity on 80 metres; the Japanese fisherfolk have been given permission to use it. It is a shared band, remember.

Primary frequencies on which observers should concentrate are 7-7.05 MHz, 7.090-7.095 MHz, 21.270 MHz, and intruders on 14.140 and 14.170 MHz using Taiwanese Chinese or Hokkien.

**Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL@VK4UN-1*

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Over to You — Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Stolen Equipment

I wish to add my sympathy to those already received by Alan de Quincy, and the hope that somehow, some of his equipment will be recovered. His "lessons learned" (August *Amateur Radio,* page 41) provide valuable information for the rest of us.

In addition I would like to make a couple of suggestions:

1. Include equipment identification data in any letter reporting such loss, and provide these data to all members in the WIA by increasing the stolen equipment column to cover, say, all losses reported in the past two or three months.
2. Advise all members to add a personal identification to each item of their present equipment. This could be the driving licence number, prefixed by State letter, engraved as recommended by Neighbourhood Watch. This could make an item more difficult to sell, and could alert a buyer to the possibility of its being recognised as stolen. If there were no market for stolen goods, then there would be little point in stealing them. Such an identification would also be recognised by police if discovered during investigations.

Thank you, Alan, for a most informative letter.

Reg Davies VK5AAG
19 Tennyson Drive
Beaumont SA 5066

Long Distance Propagation on 160 Metres

A group of seven G Stations is currently engaged in investigating long distance propagation on 160 metres (see article published in *Radio Communication,* the RSGB journal, September 1994). During last season we had many SSB contacts with the leading ZL DXer, ZL2JR. He had a total of 102 QSOs with us, and various other European stations, by means of carefully arranged scheds at Grey Line times.

We believe that it may be similarly possible to work into Australia on a semi regular basis when Grey Line times coincide. Therefore, I would be very greatly obliged if you could identify the leading VK 160 m DX specialists (if any) who regularly, or even occasionally, work into Europe on SSB, so that we may discuss experimental winter time scheds.

160 m DXing is, as you know, very much a specialist activity and it is unlikely that many persons are actively engaged in it. There are many inherent difficulties in getting reliable DX propagation.

I realise that it may take a week or two to make enquiries, but I will be greatly in your debt if you can come up with a list of leading 160 m DXers on SSB. Here's hoping you can help our DX net.

Stuart E Green G3ISG
Oakwood Lodge
Corston Fields
Bath UK BA29EZ

(Could anyone interested let us know, please, or even write direct to Stuart? Ed)

ar

Technical Correspondence

All technical correspondence from members will be considered for publication, but should be less than 300 words.

L Matching Network Design

I wish to thank Lindsay Lawless for his thought provoking "technical point", in the February 1994 issue of *Amateur Radio*, relating to the design of an L matching network for matching the source (usually 50 ohm resistive coaxial cable) to a reactive load (usually a reactive wire or whip).

However, Lindsay's explanation about the significance of "power factor" and the requirement for this type of network to operate non reactive sources and loads is, I believe, "off the track"!

Power factor, as I understand it, is only a significant design consideration where power losses (I^2R) in a network are significant and this usually occurs at low frequencies only (ie 50 Hz). Power losses in reactive elements of a network (at low frequencies) cause the phase angle, between the voltage across the reactive element to the current flowing through it, to differ from 90 degrees. Where these power losses are negligible (as for HF operation) this phase shift is extremely close to 90 degrees and almost all the energy stored in the reactive element during one half cycle is released to the load during the next. The average power dissipated in the reactive element(s) over any number of complete cycles of the applied voltage is very close to zero and the power factor is very close to 1. This should be the case for any practical network on the HF bands.

Therefore, whatever Lindsay's "supplementary network" is required to do, it certainly doesn't have to correct the power factor of the network to 1. It is already 1! Nor is it often required to deal with the transformation of a complex (reactive) impedance at the antenna feed point to the 50 ohm feed line. The L network is very "forgiving" and compensates for reactance (most of the time).

For instance, if R2=50 ohms, and R1=1-jX, then the load is highly capacitive as is the case when the L match is used to match a short (length l λ/4) mobile vertical.

Here, the inductance required to cancel the capacitive reactance X is part of the L in the L network.

If L=La+Lm, where La is the inductance of the short vertical's loading coil required to resonate the antenna (cancel out its capacitive reactance) and Lm is the inductance of the L match necessary to give the correct step down ratio, then part or all of La may be absorbed into Lm. The L match can certainly handle capacitive reactive loads when in the "step down" mode (see Fig 1).

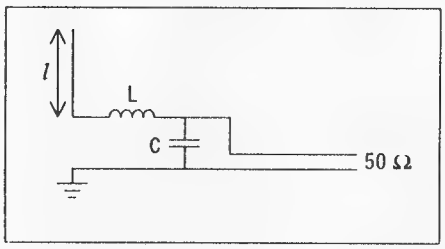

Fig 1

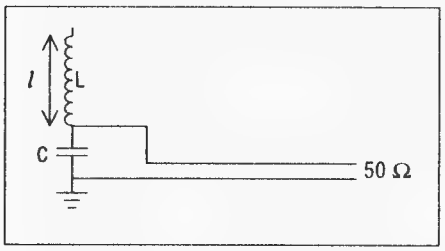

Fig 2

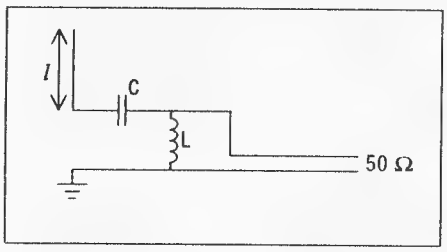

Fig 3

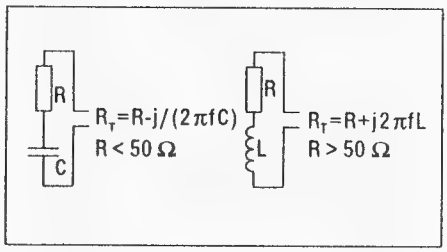

Fig 4
Where R=Ra+Rl, Ra is the radiation resistance of the antenna, Re its loss resistance and Rt is its terminal impedance.

If Lm is absorbed into La, we now have the familiar mobile helical with the added advantage that the radiation that takes place from Lm of the L network now contributes to the antenna's radiation resistance, resulting in a possible increase in radiation efficiency (see Fig 2).

If, however, R1=100+jX, then the load is inductive (l>λ/4 and l<λ/2) and the positions of the inductor and capacitor in the L network must be interchanged.

The inductive reactance X is cancelled out by part of C, and the remaining part of C is used with Lm to provide the required impedance step up ratio (see Fig 3).

The L match can therefore deal with the frequently occurring situations (see Fig 4) without the use of an auxiliary inductor or capacitor.

Tim Hunt VK3IM
20 Ravenscourt Crescent
Mt Eliza VIC 3930

Helical Aerials

The normal mode helical aerial is a useful aerial for mobile use and for limited space fixed stations. However, there is some damaging misinformation circulating about these aerials which might deter prospective purchasers and DIY constructors; that misinformation stems from an inadequate understanding of the subject and perhaps from failed DIY attempts at design and construction.

A resonant quarter wave or half wave helical is much shorter than a straight conductor version because the axial wave velocity along a helical is much less than along a straight conductor. The wave velocity is determined by the frequency, the helix diameter and the turns per unit length. Design does not, as many believe, require the length of wire to be a definite fraction of the wavelength.

The main design procedures are:

(a) Given the wavelength, the helix diameter and turns per unit length, calculate the helix length.

(b) Given the wavelength, the helix diameter and length, calculate the turns per unit length.

Design information and formula are contained in the following references:-

(1) ITT Reference Data for Radio Engineers, sixth edition 1977, pages 27.11 & 27.12.

(2) The VK3ANJ articles in *Amateur Radio,* May and July 1984.

(3) A Basic language programme by John Drew VK5DJ in *Amateur Radio,* Sept 1984.

(4) Pages 14.24 & 14.25 of the RSGB Communications Handbook, Vol 2, Fifth edition 1978.

I can supply photocopies of (2) and (3) on receipt of a request accompanied by a document size SAE.

The design is simple, but construction requires lots of patience and faith in the design procedures. Try a 10 metre prototype.

Lindsay Lawless VK3ANJ
PO Box 760
Lakes Entrance VIC 3909

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VHF/UHF — An Expanding World

*Eric Jamieson VK5LP**

All times are UTC

I have been writing these columns for a long time. In fact, with this issue, I conclude 25 years of a very happy association with *Amateur Radio* magazine, its editors and staff. Also, the thousands of amateurs known and unknown to me throughout Australia and many parts of the world. The many faithful correspondents who have regularly informed me of happenings and contacts occurring to them or known to them. I always tried to stay with VHF/UHF communications and left the more specialised modes to those best suited to their writing. I refer here to satellite and digital communications, packet, repeaters, etc all of which have evolved with the passage of time. No one column can hope to cover everything so perhaps my choice was wise.

However, for this issue I did not plan to write in such a way that backpatting may follow. You, as faithful readers, deserve something more appropriate. I therefore plan to tell you in a few columns how writers like me seem to evolve! Space limitations will mean reduced coverage of events and many happenings will not be mentioned. The use of imperial measurements is deliberate as much occurred before the introduction of decimals in 1970. If you don't like it then use your calculator to make conversions!

Eric working on a large crossword.

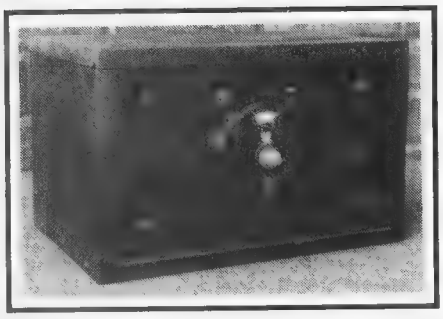
My interest in radio (or wireless as it was then known) commenced at the age of six (1930) when my parents presented me with a small gramophone. It took little time to wear the records beyond recognition, but I was hooked on music and I soon displayed an interest in the family wireless safely sitting beyond my reach on the top of the food safe. I was promptly told to leave it alone but remained fascinated that it, too, could produce music and speech with minimal effort on our part.

During one absence of my parents, I stood on a chair and reached the two dials on the 1923 model regenerative battery receiver — such fine details came to me later! Of course, I was caught in the act and, although admonished, my parents could see an emerging interest and bought me a book covering the basics of wireless. The sheer size of this book (which I called "the tome") and the trepidation it produced almost caused me to put it aside and join the other kids playing such exciting games as "touch" and "hide-and-seek."

However, I persevered and by age nine had built my first crystal set, using a jam jar as a coil former with the wire and its tappings held in place with sealing-wax. The case was made from a disused "kerosene tin" box. After much scraping of the catswhisker to the galena crystal the set received 5CL, the Adelaide National Station about 25 miles distant. My father insisted school homework rated a higher priority than the crystal set although I thought otherwise. Not hearing him approach, several times I suddenly found the headphones whisked from my ears when I was listening rather than writing. They were placed in a locked cupboard until released at the weekend.

Because my school marks were good and I continued to display an interest in wireless, for my tenth birthday Dad bought me a two-valve regenerative receiver. After consulting the tome I found it relatively easy to add another audio valve for speaker operation. Once this was done I wanted to convert the wireless to a short-wave set and over a period of time accomplished this using plug-in coils. Reasonable regeneration was possible to about 15 metres, careful pruning of the coils produced the commercial 13 metre band but the set refused to tune 10 metres. At that stage I knew little about the need for short leads as the frequencies were increased. An older relative, with greater knowledge than I, was very helpful when it came to the necessary fine-tuning to achieve useful results.

At thirteen I found myself tuning stations from all over the world. We had no power so all operation was via batteries. The absence of power also meant than the noise-floor of the receiver was extremely low and with an inverted-L antenna 100 feet long and 40 feet high astonishing results were achieved. Without realising it I found myself writing into an exercise book snippets of information retrieved from the air. Before the age of fourteen I was supplying *The Adelaide Advertiser* with half a column of short-wave listeners notes. These appeared in each Saturday's edition, on the front page in the top right-hand corner! Yes, real front page stuff.



Eric's first short-wave set. Many of the holes in the front panel were there when he acquired the set!

There were times when my notes were edited beyond what I thought necessary and this annoyed me and I said so. However, it took me little time to realise that you didn't argue with the editor as he always had the last say. That still applies today! But it was a good learning experience and these were my first forays into wireless/radio journalism.

I continued these notes until I joined the RAAF in 1942. In the meantime I found the amateur bands down to 20 metres were fascinating and many QSL cards testify to that interest. At seventeen I took a great plunge and submitted an entry to a competition sponsored by *The Australasian Radio World*. My three page article covered many aspects of the operation of battery sets and it won a prize — here for the first time my name appeared in print in a magazine! A year later I won another prize for a description of a long-range AC receiver, prepared while studying wireless in the RAAF. On completion of my studies I had little opportunity to further my personal interests in wireless due to the demands of the War.

My first posting was to Nowra where I worked on Avro Anson aircraft. Here I was in my element as these rather elderly aircraft used R1083/T1084 battery operated radio equipment. However, it was not long before I was servicing modern aircraft utilising the AWA AT5/AR8 installations plus the excellent Marconi equipment of the R1155 type. Later I was posted to Bougainville where eventually I was transferred to transmitter station duties, a task I enjoyed.

On discharge in 1946 I quickly

Eric's home antenna system at Forreston about 1980. Stacked 13 elements on two metres, 6 by 6 skeleton slot for FM, 8 over 8 for six metres with a 70 cm 16 element KLM between.

constructed an elaborate battery-operated communications receiver (we had no power until 1950) in order to continue my short-wave listening. This receiver sported an RF stage, mixer and separate oscillator, two IF stages, detector and AGC with associated BFO for CW reception (and, later, to receive SSB), plus audio stages driving a pushpull type 19 valve giving two watts of audio to a twin-cone 12 inch Goodmans speaker resulting in plenty of "grunt." I made my own band-switching mechanism, the coils being wound on the newly available Trolitol low-loss formers. Frequency coverage was from the broadcast band to about 30 MHz. There were no circuits available for such a receiver so I drew my own.

During construction, for some time I considered the merits of adding a noise limiter, but there was no noise to limit. We were sufficiently removed from the road for ignition noise to be minimal, there was no power line noise, so it required only the addition of a simple top-cut tone control to reduce static crashes when necessary. To operate a really sensitive receiver in a noise free environment was a pleasure shared by few and the dream of most operators today. Little wonder that, in addition to short-wave stations, I received scores of broadcast band stations from the USA and Europe. In those days most Australian stations closed by 1430 and did not resume broadcasting until around 2100.

In 1947 I planned to sit for my AOCP examination in an effort to become a radio amateur. However, I was heavily involved in servicing radios for the district's residents and when in 1948 I began the manufacture of mantel radios, the AOCP was placed on hold.

With the arrival of the power I bought an AR7 receiver and eventually sold the battery set to another enthusiast. I now regret not having kept it or at least photographing it. The AR7 was unusual in that it had seven coil boxes as against the normal six. The seventh box was called the FF box and covered from 25 to 45 MHz. Needless to say the original 6K8G converter was struggling to maintain oscillation above 35 MHz but an improvement resulted when it was replaced with an ECH35. This receiver responded well to modernising. Again, I wish I had kept it.

During the early 1950s a friend living about ten miles distant said we should construct one metre (288 MHz) equipment. When I said we had no licence he replied, "So what, nobody will hear us out here!" We constructed identical super-regenerative equipment and coupled this to a horizontal dipole antenna. The receiver used a 955 detector with a 6J5GT and 6V6GT for audio. The transmitter was a modulated oscillator and used a pair of 7193s and a 6V6GT modulator. All tuned circuits were lecher lines and had an efficiency which could not be bettered at the time.

Originally we had no idea of our operating frequency but believed we were close to 288 MHz. My friend eventually constructed an absorption wavemeter which he had professionally calibrated. We were operating on 291 MHz so were within the limits of the amateur band. We had many contacts over the next few years and only ceased when my friend moved to another area. We knew of other pirates in the Adelaide area but decided against working them in order to keep our clandestine operations to ourselves.

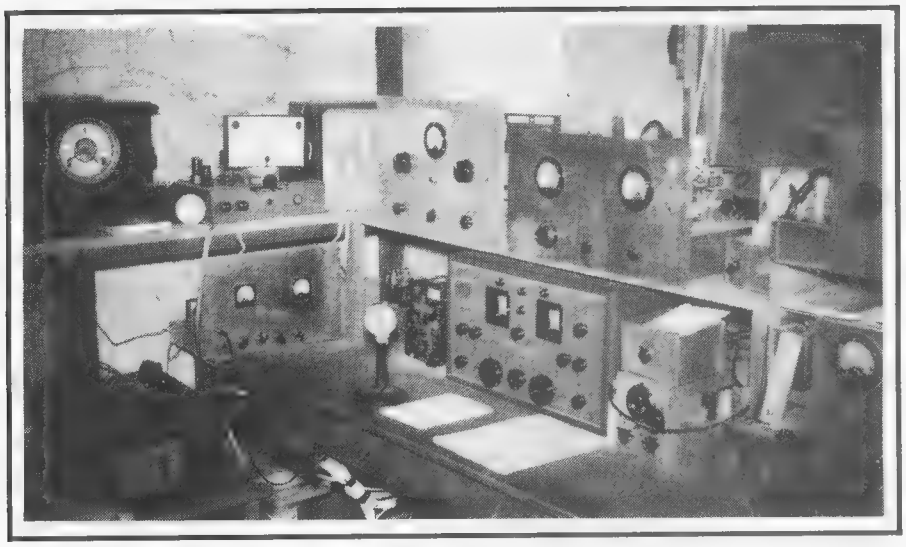
By now I was becoming increasingly interested in VHF operation. Solar Cycle 19 was approaching its peak so the trusty AR7 was coupled to a Kingsley KC6 50-54 MHz converter which I had bought about 1950. The tuning was accomplished by varying the inductance of the coils and the antenna input was 300 ohms. A 6AK5 RF stage and an ECH35 converter with an IF of 10.7 MHz made up the valve complement. The whole thing drifted like crazy! Considerable improvement was effected by voltage regulation and careful selection of ECH35s as some drifted more than others. A modified Channel 2 TV antenna with 300 ohm output was mounted on a 20 foot length of water pipe to receive the signals, the structure being turned by the "armstrong method."

This relatively inefficient set-up provided me with 50 MHz signals from JA, W, KH6, ZL, VK9 (New Guinea) and countless VKs. As is the case today, I found many signals were best received from 2200, especially during the 1958 peak of the cycle. I was learning quickly and was obviously hooked on VHF operation.

With some prodding from my friend Wally, now VK5TW, I obtained my LAOCP in 1961 and Wally (VK5ZEH) and I (VK5ZEJ) proceeded to make 50 MHz contacts over our three mile path. Needless to say signals were strong but as we could operate almost four MHz apart it was possible to use duplex on the same band! Later, when we constructed two metre equipment, we found crossband operation was a breeze.

Under directions from his wife Colleen, Wally was restricted to a four element beam at about thirteen feet. Her comment was, "Keep that ghastly thing as low as possible, whatever will the neighbours think?" I faced no such restrictions and my six metre antenna was a William J Orr six element at 30 feet.

It was the era of home-brewing AM equipment, so my transmitter ran 100 watts from two 807s modulated by a pair of 807s. Later, two 809s allowed 100 watts of audio to be used. As the modulator featured carefully tailored high level filtering and clipping it was possible to use large amounts of audio without significant broadening of the transmitted signal — at least no one complained but they did



The radio shack after five years. From left — top shelf, six metre transmitter, two metre transmitter. Lower shelf — Command transmitter as VFO, Hammarlund HQ-150 receiver, 3-6 MHz Command receiver, two metre converter and, extreme right, part of AR7 receiver. To the left of the operating position is the 100 watt 809 modulator next to a Grundig tape recorder.

comment on the ease with which the signal could be copied!

By the mid-1960s I was taking an interest in portable operation but it was rather a daunting task taking the base station equipment. On two occasions I joined with John VK5QZ and Des VK5ZCU (now VK5ZO) and operated from a good site near Palmer on the eastern perimeter of the Adelaide hills. We had a mass of equipment which filled a caravan. I provided six metres, John two metres and Des 70 cm, the latter using DET24 valves brought from England, his equipment fully occupying one end of the caravan. We did not do things by half measures as you can see from the print of the antenna systems.

With the passage of time portable equipment became smaller and was more easily transported to appropriate sites. In all I used more than 25 sites scattered throughout the State plus a couple of excursions across the border into VK3. I was either very keen or simply mad!

For some time I had supplied the VK5WI Sunday morning broadcast with VHF notes prepared on tape. This eventually was to become my "un-doing" as in 1969 Geoff Taylor VK5TY, the VK5 Federal Councillor, proffered (dobbed?) my name as a possible candidate to write the VHF notes for *Amateur Radio.* The rest is history. I accepted and remain here, so far not having had to withstand a coup or overthrow by a dictator but I suppose there is still time for that to occur. Nor have I so far been castigated by the Editor, probably remembering my earlier teen-age thoughts that you are on losing ground when you start arguing with an editor!

Apart from writing for magazines, my career in journalism has enabled me to write books; ten have been written and published to date, most orientated towards local history. The greatest aid towards writing in all its forms has been the introduction of the computer and I have made good use of this facility.

Since 1985 I have suffered a progressive disease of the spinal column which has now confined me to a wheelchair. At that time I considered ceasing writing but then came to terms with my affliction, and was grateful that I still had the use of my arms and hands and apparently my brain! My writing has been more prolific in affliction than previously. During the past few years there have been the odd occasions when there was no way my health would allow me to produce these columns. David VK5KK substituted for me a couple of times. Occasionally the task of preparing information to meet a printing schedule has been almost beyond me but inner strength has prevailed so, in 25 years, there have been very few missed occasions.

My disease will eventually destroy me but, in the meantime, I thank God that I have been spared to continue to be useful despite a handicap. I am grateful for a loving, caring wife who has supported me all the way and continues to do so. Life without her would be unbearable.

Closing with two thoughts for the month:

1. Those who make the worst use of their time most complain about its shortness, and
2. Kids have it tough. Where they used to walk to school and keep warm by running part of the way, now they stand and shiver waiting for the bus!

73 from The Voice by the Lake.

**PO Box 169 Meningie SA 5264*
FAX: 085 751 531 Packet to VK5ZK for VK5LP

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

S J (Jim)	LLOYD	VK1JL
A L	LANGFORD	VK2ASX
T (Tom)	CAHILL	VK2IY
L W P (Lewis)	SMITH	VK2LS
A R	GRAY	VK2RO
D A (Des)	GREENHAM	VK3CO
W H	FINCH	VK5AWF
O H (Owen)	LANGHAM	VK7OL

Rear Admiral Surgeon Dr John (Jim) Lloyd OA VK1JL

"Jim" was made an Officer of the Order of Australia in 1978. He was born 15 June 1923 and passed away on 15 September 1994, aged 71.

He served in the British Army during World War II. He completed his medical training in Britain and was only 29 when he came to Australia and joined the RAN in May 1952. He was promoted to Rear Admiral Medical in May 1976 on appointment as Director General Naval Health Services. He retired from the RAN in April 1981. During the early 1970s he served as a member of the Federal Executive of the WIA.

While on secondment to the Royal Navy, he became a member of the Royal Navy Amateur Radio Society (RNARS) and fostered its goodwill within Australia. As a founding member with his number 49 and callsign VK1JL, he became one of the first operators to use the RNARS callsign VK1RAN with his log entry on 21 June 1986.

His involvement with amateur radio in the Royal Australian Navy extends back to the days of the Australian carrier era. He often told of operating a 2 metre transceiver off the coast. He was one of the first amateurs to write a Defence Instruction covering amateur radio operations in the Royal Australian Navy. Somehow his instruction "Amateurs may

operate from ships at sea" was converted to "Amateurs may not operate from ships at sea" as the story goes.

The first opening ceremony of the Baden Powell Scout station VK1BP, was from Camp Cottermouth in 1974. It moved to Government House in 1976. He became an operator of VK1BP in 1979 and Chief Operator in 1982. Together with Dick Perryman, National Scout Secretary, and Peter Hughes, National JOTA co-ordinator, he saw to the yearly setting up of VK1BP on the lawns of Government House, in preparation for the opening speech by the Governor General, the Chief Scout and Chief Guide. His most famous quote "Never the same operations twice" was heeded by all.

He was famous for his linear amplifier that glowed in the darker surrounds of the pavilion as transmission occurred and caused many a modern Scout and Guide to wonder at the glow of the 813 valve plates. His bright conversation and patronage will be sorely missed at this year's Jamboree Of The Air. True to predictions, operations will be different this year.

He was also very active in the St John Ambulance Brigade and loved being involved in the rescue craft on race days at the Royal Canberra Yacht Club.

Our sympathy is extended to his wife, Mary, from all at the Royal Naval Amateur Radio Society, Scout Association and organisations associated with him during his active and fulfilling life.

Take care "Jim" and a final 73 from us all.

Dave Lyddieth VK1DL/VK1RAN, and Chief Operator VK1BP

Harry Vause VK2HV/VK4HV/VK1HV

Harry Vause QX2125 of Balmain, Townsville, and ex Heard Island 1950 ANARE, died on 8 September of a heart attack, aged 81 years.

Harry was born at Brisbane on 17 January 1913, educated at Blackheath and Thornburgh College, Charters Towers, spending most of his youth at Townsville and playing Rugby for North Queensland as Rugby Premiers 1928 and Brisbane Premiers 1938/39.

When WW2 was declared he joined the Army, serving in the 6th Division Cavalry Commandos, as they later became known, and was twice wounded in North Africa fighting against the German/Italian armies led by General Rommel. He was in Tobruk during the siege, later returning to Australia to recover from the wounds.

Working as a waiter during the evening, he studied for a First Class Commercial Operators Certificate with AWA during the day. After passing the exams he went to sea as a Radio Officer with the Merchant Navy for a number of years, circumnavigating the world seven times. He then joined the Department of Civil Aviation and was posted to various positions on the east coast of Australia.

He was selected in 1949 as Radio Officer for the Australian National Antarctic Research Expedition to Heard Island, travelling there on HMAS Labuan LST 3501. He performed his duties with excellence under the trying conditions caused by Auroras. He was well liked by all expedition members, and the three Radio men, Harry, John Gore VK1PG and myself (VK2YG) kept in constant contact for 45 years.

There could only be one Harry Vause and he will be sadly missed.

Leo McGarrigle VK2YG

Lewis Smith VK2LS (ex VK2AWS)

Lewis Smith had been a wireless enthusiast ever since hearing the words *"Hullo, this is the BBC calling"* on his first home made radio.

Lewis was a very active radio amateur and became one of the founding members of the Oxley Region Amateur Radio Club. He received the Clubman of the Year Award in 1984 for his assistance and help and for club activities. He was awarded Life membership of the club in 1994. He received many amateur radio operating awards.

For many years he conducted a local network where local amateurs could chat on a weekly basis from the comfort of their home.

Lewis had the firm belief that a good amateur is a citizen of the world, that he promotes peace and friendship and that the barrier to distance and isolation no longer exists. He found amateur radio the ideal form of communication providing a common ground for people regardless of wealth or status, bringing together the greatest possible diversities of human endeavour in one common bond.

Lewis was always willing to assist and instruct anyone interested in radio or electronics. In the passing of Lewis Smith VK2LS the amateur fraternity has lost a good friend.

Peter Alexander VK2PA

Lindsay Stephens VK2ACO

Lindsay Stephens VK2ACO passed away on 6 August at the age of 71 after a long illness. True to his nature, Lindsay fought a long hard battle against cancer before succumbing with dignity.

Lindsay had devoted his whole life to communications. He played his part in providing radio communications for the RAAF in Northern Australia and New Guinea during the dark days of World War 2. The remainder of his working life was spent in the PMG and Telecom where he attained the position of Supervising Engineer North Coast (NSW) before his retirement. Lindsay tackled work, amateur radio and all of his life with enthusiasm and a burning passion for excellence. Nothing was ever done half heartedly. Retirement did not lessen Lindsay's drive to tackle new technical challenges. At the time of life when many people let their expertise stagnate, Lindsay kept his wealth of knowledge fresh and up to date.

Lindsay leaves behind his wife Doris and three daughters. Those of us who knew Lindsay through work or play share their loss as we warmly remember the enrichment of his companionship. May the ideals he passed onto us continue to flourish.

Duncan Raymont VK2DLR

Owen Langham VK7OL

With the passing of Owen Langham on 13 September one of the true gentlemen of the WIA has gone from us. But the members of the Tasmanian WIA will long remember one who made his mark through his strength of character, his quiet unassuming manner and the way he always saw the best in everyone.

Owen spent his life in various areas of the North-West coast and had been "playing around" with radio since his boyhood, but it was not until he retired as maintenance engineer at the Devonport Ovaltine factory that he set about to study for his call, obtaining his Novice licence in 1982 and his full call in 1983.

He was an active member of the famous Tasmanian "Sewing Circle" and recently had lent his support to the new Central Highlands Radio Club. His shack was an example to all of us — walls lined with awards and a place for everything.

Owen had a strong Christian faith in the old Methodist tradition and he lived that faith. His life spoke more than any words could ever do. Since a heart attack five years ago he regarded every new day as a bonus but that heart could not cope with a serious leg operation.

To his wife and best friend, Nancy, and their children we give our condolences. We have all been better people for having known VK7OL.

Ron Churcher VK7RN

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Sign up a new member today — we need the numbers to protect our frequencies and privileges.

Spotlight on SWLing

*Robin L Harwood VK7RH**

The BBC World Service has confirmed that it is going ahead with six regional editions of World Service programming in 1995. No commencement date has been announced yet but there has been plenty of opposition to the proposed changes from the wide international audience. At least the "Beeb" should be given the opportunity, in my humble opinion, to trial the new concept. They also stated that each of the regional editions will include programming of interest to the listeners within that geographical area, yet will still include a World focus.

Signals from London to the Pacific area of late have been poor, mainly due to the declining sunspot count. Sadly, the powerhouse that used to be on 7150 kHz from 0545 till 0810 UTC was dropped. 9410 and 12095 kHz don't become audible here until 0700. I realise that the BBC has rebroadcasting outlets on AM and FM in Sydney, Melbourne, Auckland, Brisbane, Christchurch, Wellington and Hobart. Some of these are available by subscription, whilst the Brisbane, Hobart and Melbourne outlets are via the Print Handicapped stations, on an overnight basis. 7RPH, in fact, broadcasts the BBC continuously from 11.00 pm Saturday evenings until Monday morning at approximately 7 am. Very convenient for me to listen to through the daylight hours when no propagation exists. Also, note that "Newshour" program is carried live over the ABC News and Parliamentary network at 0500 and 1300 UTC.

At the height of the "Cold War", many of the international broadcasters had programming in a variety of language groups. Now this conflict has ended, most of these stations have dramatically slashed their output due to budgetary constraints. Radio Moscow had the largest output with about 61 at one time. On 26 September, the number of languages was further reduced from 47 to 38. As well, the general output from all Russian external services was cut back. This has reduced a little the congested allocations. Perhaps the only international broadcaster who hasn't reduced its language groupings or output is China Radio International in Beijing.

Monitor Radio International in Boston relinquished control of their first shortwave sender, WCSN in Scotts Corner, Maine, early in September. As I have mentioned in the past, an Adventist splinter group in Florida purchased the sender and began broadcasting when MRI wasn't using the station. I logged it at around 0145 UTC on the unusual split channel of 9852.5 kHz. However, MRI has indicated that the new owners will apply for a callsign change to WVHA. The station probably will be known as the "Voice of Historic Adventism".

One of the e-mail echos I have access to is "rec.radio.shortwave" on FIDONET. However, I can't get any information on how to access an Australian oz-sw echo that I know is available. The sysop of my main FIDONET BBS is rather slow at posting this and I would be interested in finding out where it is available and its access, etc. Please reply to my e-mail address either on FIDONET or INTERNET.

Well, that is all for November. Until next time, the very best of listening and 73!

**54 Connaught Crescent, West Launceston TAS 7250*
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FIDONET: Robin Harwood 3:670/312
VK7RH@VK7BBS LTN.TAS.AUS.OC

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WIA News

Progress in Radio Sport

Amateur radio a sport? Well, if you combine radio direction finding and cross-country jogging, amateur radio becomes a sport! Rather like a foxhunt and footrace, if you like.

It's a rapidly growing aspect of amateur radio in Asia and Europe, and it's taking off in North America (see *WIA News*, in October *Amateur Radio*). The object is to locate a series of transmitters spread around a course which meanders through the countryside. The transmitters are turned on and off at sequenced intervals, just to make things a bit more challenging.

Australia's leading exponent of amateur radio direction finding (ARDF) is the redoubtable Wally Watkins VK4DO. Wally's no "spring chicken", so you can see it's a sport for all ages.

Wally refereed at the 7th World ARDF Championships in Sweden, after attending the Region 3 IARU Conference in Singapore. Frank Sleep VK4CAU is competing at the Championships in Sweden.

If you want to see what ARDF's all about, Wally has prepared a short video tape, copies of which he has circulated to each Division. Radio clubs may get copies direct from VK4DO for $10 (to cover post and packing). The tape covers highlights from the 1993 Region 3 ARDF games held in China. ARDF games are serious stuff, says Wally. In the tape, emphasis is placed on the importance of the games as can be seen by the many high ranking government officials present.

Wally says, "We were told that if China had won the Olympic Games in the Year 2000, ARDF would have been a demonstration sport as it was in the Asian Games a few years ago."

Wally will return from Europe on 6 December. Write to him at PO Box 432, Proserpine QLD 4800.

Meanwhile, ARDF is catching on in Queensland. Several groups are reportedly building receivers based on a design by VK3MZ. The Redcliffe Amateur Radio Club are coordinating activities. It is anticipated that Australia's first radio sport competition will be held in Brisbane early in December.

In the far North, Ron VK4BRG has developed a kit for a 2 m antenna based on the successful HB9CV design. In NSW's West, a group at Bathurst are working on an 80 m transmitter. Timers for sequencing the transmitter on and off are a bit of a problem, according to Wally. The ZLs are working on an EPROM version while awaiting information to come from Europe which Wally has promised to follow up while in Sweden.

The South East Radio Group (SERG) in Mount Gambier, SA, will host Wally to give a lecture and demonstration at their annual convention in June next year. Wally is prepared to give a lecture and demonstration to other interested groups while travelling from Proserpine to Mount Gambier, on the basis of being billeted in each area.

The next Region 3 ARDF Championships will be held in Townsville, probably in 1996, a decision made at the September IARU Region 3 Conference in Singapore.

HF PREDICTIONS

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for five of the bands between 7 and 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μV (dBU) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μV at the receiver's input and the S-meter scale is 6 dB per S-point.

V in 50 ohms	S-points	dB(μV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used in these calculations is 22.4. The predicted value for December is 21.9.

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VK SOUTH — SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	18.5	18	15.0	23	18	11	0	-14
2	18.8	18	15.5	24	19	12	1	12
3	18.8	18	15.5	24	20	12	1	12
4	18.8	19	15.4	26	20	13	1	-12
5	18.7	20	15.2	27	21	13	1	-13
6	18.4	21	15.0	30	22	13	0	-14
7	18.1	24	14.7	33	24	13	0	-16
8	17.3	26	14.0	35	23	12	4	-21
9	16.4	27	13.3	35	21	8	9	-28
10	15.5	28	12.4	33	18	4	15	-37
11	14.7	29	11.7	31	14	-1	22	
12	14.0	30	11.1	29	11	-5	28	
13	13.5	30	10.7	27	8	-9	33	
14	12.9	31	10.2	25	5	13	-39	
15	12.3	31	9.5	23	1	18		
16	11.4	33	8.7	18	-6	28		
17	11.2	33	8.5	17	-7	30		
18	11.0	32	8.3	15	-9	33		
19	11.6	25	8.7	15	-5	25		
20	13.3	21	9.8	18	4	-10	32	
21	15.4	19	11.6	22	12	1	-15	-34
22	17.1	19	13.1	23	16	7	-6	-22
23	17.9	18	14.0	23	18	10	-2	17
24	18.4	18	14.6	23	18	11	0	-14

VK WEST — SOUTH PACFIC

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	22.4	14	17.8		17	19	16	10
2	22.5	14	18.2		16	19	16	10
3	22.9	14	17.0		17	19	17	11
4	22.9	15	18.9	-36	18	20	17	11
5	23.0	16	18.8	-28	21	22	18	12
6	22.7	17	18.6	-15	24	23	20	12
7	22.4	19	18.2	3	29	26	21	13
8	22.0	21	17.8	22	34	29	23	13
9	20.9	23	16.8	37	37	30	22	11
10	19.7	25	15.8	44	38	29	20	8
11	18.7	26	14.9	48	38	27	18	5
12	17.8	27	14.2	50	37	26	16	2
13	17.0	28	13.5	51	36	24	13	2
14	16.3	28	12.9	50	35	22	11	-5
15	15.7	29	12.3	50	34	20	8	9
16	14.8	30	11.3	49	32	18	4	-14
17	13.7	31	10.4	49	29	13	1	-21
18	13.5	31	10.2	48	28	12	-2	23
19	13.4	26	10.1	31	24	10	4	-24
20	14.1	22	10.6	15	22	11	1	-18
21	16.2	19	12.8	-1	21	15	6	-6
22	18.9	16	14.3	-19	20	18	12	3
23	21.0	15	16.1	-30	19	19	15	8
24	21.9	15	17.1	-37	17	19	16	9

VK EAST — AFRICA

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	14.6	12	10.2	-26	12	7	0	-13
2	13.2	7	10.1	-37	7	3	-4	-18
3	13.6	4	10.3	...	4	3	-3	-15
4	16.4	5	12.4	..	3	5	2	-5
5	19.9	7	14.0	..	1	7	7	2
6	20.0	7	14.0	...	0	7	6	2
7	20.2	7	14.1	...	0	7	7	2
8	20.2	8	14.1	..	1	8	7	2
9	19.5	9	14.2	...	4	9	7	2
10	18.5	10	14.0	..	7	10	7	0
11	17.4	11	13.8	...	11	11	6	-2
12	16.4	13	13.1	-28	14	11	5	-5
13	15.6	16	12.4	-10	17	12	4	-8
14	15.1	20	11.9	7	21	13	3	-11
15	14.5	24	11.4	27	25	13	2	-14
16	13.9	26	10.8	35	26	12	0	-18
17	13.3	28	10.2	40	25	10	-3	-23
18	12.8	30	9.7	43	25	8	-6	-27
19	12.5	30	9.3	43	24	7	-8	-30
20	13.2	29	9.0	44	26	10	-4	-24
21	12.7	26	8.7	31	22	7	-7	-28
22	12.3	22	8.5	18	18	4	-9	-29
23	12.3	17	8.5	2	14	3	-9	-28
24	13.0	14	9.1	-9	13	5	-6	-22

VK SOUTH — AFRICA

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	14.1	15	10.7	-11	15	8	-1	-15
2	14.6	12	11.0	-24	13	8	0	-12
3	17.5	12	13.8	.	11	11	7	-1
4	20.6	11	14.6		9	13	11	5
5	20.6	10	14.8	.	6	11	10	5
6	20.8	10	14.8		4	10	9	5
7	20.6	9	14.6	.	4	10	9	4
8	20.4	9	14.5	..	4	10	9	4
9	20.3	10	14.4	...	6	11	9	4
10	19.5	11	13.8	...	9	12	9	3
11	18.5	12	13.0	..	11	12	9	1
12	17.2	14	12.1	-28	15	13	7	-2
13	16.1	16	11.3	-11	18	13	5	6
14	15.2	19	10.6	7	21	13	4	-10
15	14.8	23	10.2	25	25	14	3	-13
16	14.1	26	9.7	35	26	13	0	-17
17	13.7	28	9.5	39	26	12	-2	-21
18	13.2	29	9.2	43	26	10	-4	-24
19	13.1	30	9.2	44	25	9	-5	-26
20	13.3	29	9.4	44	26	11	-4	-24
21	13.5	28	9.4	39	26	11	-2	-22
22	13.2	24	9.2	27	22	9	-4	-23
23	13.2	21	9.3	16	19	8	-4	-23
24	14.0	18	9.9	3	18	9	-1	-17

VK WEST — AFRICA

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	13.3	21	10.1	11	19	8	4	-22
2	13.7	17	10.4	-4	16	8	2	-18
3	16.6	14	13.1	24	15	12	6	-5
4	20.6	13	15.8	.	14	15	12	5
5	21.3	12	15.8		10	14	12	6
6	21.3	11	17.5		8	13	11	6
7	21.4	10	17.5		7	12	11	5
8	21.1	10	17.2		7	12	10	5
9	20.8	11	16.9		8	12	10	4
10	20.5	11	16.6		10	13	10	4
11	19.7	12	16.2		13	14	10	3
12	18.6	14	15.0	27	17	15	10	1
13	17.5	17	14.1	7	21	16	9	-2
14	16.6	20	13.2	12	24	17	8	5
15	15.7	24	12.5	30	28	17	6	9
16	15.2	26	12.0	39	29	16	4	12
17	14.5	27	11.8	43	29	15	1	16
18	14.0	29	10.9	45	28	13	-1	-20
19	13.4	29	10.3	46	27	10	-4	-25
20	12.9	30	9.8	46	25	8	-8	30
21	12.6	30	9.5	45	24	7	-10	-32
22	13.3	30	10.0	46	26	10	-5	26
23	13.4	28	10.2	39	25	10	-4	-25
24	12.8	24	9.7	25	20	6	-8	28

VK EAST — ASIA

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	27.1	15	21.8	...	20	24	23	19
2	28.0	13	21.4	...	19	23	22	18
3	28.6	13	22.3	...	19	23	22	19
4	29.6	14	22.5	...	20	24	24	20
5	30.1	15	23.4	...	22	26	25	22
6	29.0	16	23.8	-30	24	27	26	22
7	27.8	17	22.7	-15	28	29	26	22
8	26.4	18	22.0	8	33	31	27	21
9	25.1	20	20.3	32	39	34	29	21
10	23.8	21	19.1	40	40	34	27	18
11	22.8	22	18.2	46	41	33	26	16
12	22.3	22	17.7	49	41	33	25	15
13	21.3	23	16.9	53	41	32	23	12
14	20.2	23	16.0	52	40	30	20	8
15	18.8	23	14.5	52	37	25	14	-1
16	17.3	23	13.2	51	34	20	7	-10
17	15.8	25	12.2	50	30	15	0	-19
18	13.5	25	10.4	48	22	2	-17	...
19	10.5	27	8.1	43	4	-26	...	...
20	10.6	27	8.2	42	5	-25	...	...
21	15.8	20	12.0	29	25	12	-1	-20
22	23.5	16	18.2	5	30	27	21	13
23	25.4	16	20.3	-18	25	26	23	17
24	25.9	16	21.0	-32	22	24	22	17

VK SOUTH — ASIA

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	20.5	13	16.4	...	14	16	12	5
2	20.7	13	16.8	...	13	15	12	6
3	21.3	13	17.6	...	13	16	13	7
4	21.4	13	17.7	...	13	16	14	7
5	21.5	14	17.6	...	14	17	14	8
6	21.2	15	17.4	...	16	18	15	8
7	20.8	16	17.0	-27	20	19	15	7
8	20.3	18	16.5	-8	24	21	16	7
9	19.5	22	15.8	28	33	25	17	5
10	18.5	23	14.9	39	34	24	15	1
11	17.5	24	14.0	44	34	22	11	-4
12	16.6	25	13.2	47	33	19	7	-9
13	15.9	25	12.6	49	31	17	3	-14
14	15.3	26	12.1	49	30	14	0	-20
15	14.6	26	11.5	48	28	11	-4	-25
16	14.0	26	10.9	47	25	7	-9	-32
17	13.3	26	10.3	46	22	2	-17	...
18	11.9	24	9.1	43	11	-15	-39	...
19	9.3	26	7.1	37	-11	...	..	...
20	9.3	26	7.2	37	-10	...	...	..
21	13.9	19	10.5	30	18	1	-16	..
22	17.3	18	13.2	4	23	16	7	-5
23	19.2	16	14.9	-21	19	17	12	2
24	20.0	14	15.7	-36	16	16	12	4

VK WEST — ASIA

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	24.2	16	19.3	-30	22	23	20	15
2	24.7	15	19.9	-38	20	22	20	15
3	25.6	15	20.9	.	19	22	21	16
4	27.0	15	20.5		19	23	22	18
5	27.8	16	22.0		20	24	23	20
6	28.2	16	22.9	-39	21	25	24	21
7	27.9	17	22.9	29	24	27	25	21
8	27.0	17	22.1	-15	27	28	26	21
9	26.0	19	21.1	7	33	31	27	21
10	24.7	21	20.6	40	41	35	29	21
11	23.5	22	19.0	47	42	35	28	18
12	22.3	22	17.9	50	42	33	25	15
13	21.3	23	17.0	52	41	32	23	11
14	20.7	23	16.4	53	40	31	22	9
15	19.8	23	15.7	52	39	29	19	6
16	18.9	22	14.3	52	37	25	13	-1
17	17.3	22	13.2	51	33	19	6	-11
18	15.9	23	12.2	50	30	13	-1	-22
19	13.5	24	10.3	47	20	1	21	
20	10.5	25	8.1	42	0	-33		
21	10.6	25	8.2	42	1	-31		
22	15.8	21	12.3	40	27	12	3	-23
23	20.9	18	16.1	3	27	23	17	7
24	23.5	17	18.4	-17	25	24	21	14

VK EAST — EUROPE

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	9.7	-1	7.6	-24	1	-11	-26	..
2	8.9	-8	7.0	-29	0	-12	-27	.
3	9.0	-12	7.1	-35	0	-10	-24	...
4	10.4	-8	8.0	..	0	-6	-16	-34
5	13.2	-1	10.5	...	1	0	-6	-19
6	16.3	4	13.1	..	1	4	1	-7
7	18.8	7	15.1	...	1	7	5	0
8	20.8	9	16.7	...	4	10	9	4
9	22.0	12	17.8	...	11	15	13	8
10	22.7	15	18.0	-24	21	21	18	11
11	21.7	20	17.4	4	28	25	21	13
12	20.7	22	16.6	22	33	27	21	12
13	20.1	23	16.0	37	36	28	20	9
14	18.6	23	14.8	42	34	24	15	2
15	16.4	25	13.1	45	32	19	7	-8
16	14.2	26	11.6	44	26	11	-4	-24
17	12.6	27	9.9	42	21	2	-16	...
18	11.1	28	8.7	40	14	-8	-29	...
19	10.4	29	8.1	39	10	-15	-38	...
20	9.9	29	7.7	38	7	-19	...	..
21	9.5	26	7.3	31	5	-20	...	..
22	9.5	19	7.3	16	4	-18	...	..
23	9.9	11	7.7	0	4	-13	-32	..
24	10.1	5	7.8	-14	3	-11	-27	...

VK SOUTH — EUROPE

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	10.4	4	8.1	-19	4	-8	-22	...
2	9.6	-3	7.5	-29	1	-10	-24	...
3	9.6	-8	7.6	-38	0	-8	-21	...
4	11.4	-5	8.6	...	1	-3	-12	-27
5	14.6	0	11.6	..	0	1	-2	-12
6	18.1	4	14.5	...	-2	4	3	-2
7	20.6	6	16.6	...	-3	5	6	2
8	21.9	8	17.9	...	-2	7	8	6
9	21.5	10	17.5	...	0	9	10	7
10	20.7	12	16.7	...	7	13	12	7
11	19.6	15	15.8	...	15	16	13	7
12	18.5	19	14.8	-6	23	20	14	5
13	17.5	23	14.0	20	29	22	14	2
14	16.7	26	13.3	34	32	22	12	-1
15	16.1	27	12.7	40	32	21	10	-4
16	15.3	26	12.2	43	29	16	3	-15
17	13.6	27	10.6	44	25	8	-7	-28
18	12.1	28	9.4	42	19	0	-19	..
19	11.2	29	8.6	41	15	-6	-27	..
20	10.7	29	8.2	40	12	-11	-34	..
21	10.4	29	7.9	39	11	-13	-37	...
22	9.7	23	7.4	24	5	-19	...	...
23	9.4	15	7.3	10	3	-18	..	...
24	10.8	11	8.3	-5	7	-7	-23	..

VK WEST — EUROPE

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	11.0	14	8.5	3	7	-9	-26	..
2	10.1	6	7.8	-11	2	-13	-30	
3	10.1	-1	7.9	-26	0	-11	-26	.
4	12.0	0	9.1	...	2	-4	-14	-30
5	15.6	4	12.4	...	3	3	-2	-12
6	19.4	7	15.6	...	1	7	5	0
7	22.0	7	17.8	...	0	8	8	4
8	24.0	8	19.4	...	0	9	10	7
9	25.1	9	20.4	...	1	10	11	9
10	24.6	11	20.0	...	4	12	13	11
11	23.5	13	19.5	...	10	16	15	11
12	22.3	16	18.0	-27	20	21	18	11
13	21.1	20	17.0	9	29	25	19	11
14	20.2	22	16.1	33	34	27	20	10
15	19.1	22	15.0	39	34	24	15	3
16	16.5	24	13.5	42	30	18	6	-9
17	14.6	25	11.4	44	27	12	-2	-22
18	12.9	27	10.0	43	21	3	-14	-37
19	12.0	27	9.2	42	18	-2	-22	...
20	11.4	28	8.7	41	15	-7	-28	...
21	11.0	28	8.4	40	13	-10	-32	.
22	10.9	28	8.5	40	12	-11	-33	.
23	10.6	27	8.1	35	11	-12	-34	.
24	10.6	20	8.2	19	9	-11	-31	.

VK EAST — EUROPE (Long Path)

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	10.0	-4	7.5	-33	2	-6	-18	-36
2	10.2	0	7.8	-25	3	-6	-18	-37
3	10.4	5	7.9	-16	5	-6	-19	-39
4	10.0	7	7.7	-9	5	-8	-23	...
5	9.2	10	7.2	2	3	-14	-32	...
6	9.2	17	7.3	13	4	-15	-35	...
7	10.8	23	8.5	25	12	-6	-24	...
8	13.7	24	10.9	33	23	9	-4	-23
9	13.2	25	10.0	25	22	11	-1	-17
10	13.3	17	10.1	-3	16	8	-1	-15
11	16.5	12	13.1	-36	12	11	6	-2
12	15.9	6	12.6	...	4	6	3	-4
13	15.2	1	12.3	...	-1	3	0	-6
14	14.6	-3	11.3	...	-4	1	-1	-8
15	13.9	-7	10.7	..	-6	0	-2	-9
16	13.3	-9	10.1	..	-6	-1	-3	-10
17	13.0	-11	9.8	..	-6	-1	-3	-11
18	13.7	-8	10.2	...	-7	-1	-3	-9
19	14.7	-5	11.5	..	-6	0	-2	-9
20	13.0	-8	10.1	..	-4	-1	-5	-14
21	11.5	-10	8.9		-2	-2	-8	-19
22	10.7	-11	8.2	..	0	-3	-11	-24
23	10.2	-10	7.8	.	0	-4	-13	-29
24	10.0	-7	7.6	..	1	-5	-16	-33

VK SOUTH — EUROPE (Long Path)

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	9.3	-7	7.1	-30	0	-10	-23	...
2	9.5	-2	7.3	-23	1	-11	-25	...
3	9.5	2	7.3	-14	1	-12	-28	...
4	9.2	5	7.1	-6	1	-15	-33	...
5	8.4	8	6.6	2	-2	-23	...	...
6	8.5	14	6.7	11	-2	-26	...	...
7	9.7	22	7.7	23	5	-18	...	..
8	12.1	23	9.6	29	16	-1	-17	..
9	13.5	24	10.5	31	22	8	-5	-23
10	10.5	21	8.1	20	10	-8	-26	..
11	10.5	14	8.1	3	8	-6	-22	...
12	14.9	13	10.3	-22	13	9	2	-9
13	14.2	5	10.1	..	5	5	0	-11
14	13.7	0	9.5	...	1	2	-2	-12
15	13.2	-5	9.2	...	-2	0	-3	-12
16	12.8	-9	9.0	...	-4	-1	-4	-13
17	12.8	-10	9.0	...	-5	-1	-4	-12
18	13.6	-9	9.6	...	-6	-1	-3	-10
19	13.4	-8	10.5	...	-5	-1	-5	-13
20	11.8	-12	9.2	...	-3	-2	-7	-18
21	10.4	-15	8.1	..	-2	-3	-10	-23
22	9.8	-16	7.6	...	-1	-5	-13	-28
23	9.3	-15	7.2	...	0	-6	-17	-33
24	9.2	-12	7.0	-38	0	-8	-20	-38

VK WEST — EUROPE (Long Path)

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	8.9	-18	6.8	...	-2	-10	-21	-38
2	9.0	-14	7.0	-37	-2	-11	-23	...
3	9.0	-10	7.0	-31	-2	-13	-26	...
4	8.7	-7	6.8	-23	-2	-15	-31	
5	8.0	-7	6.3	-14	-5	-21	..	.
6	8.1	-2	6.4	-9	-5	-23	...	.
7	9.1	7	7.2	-1	-1	-19	-38	..
8	11.3	13	9.0	5	7	-7	-22	..
9	14.0	16	11.2	10	15	4	-7	-24
10	13.3	22	10.3	28	19	5	-8	-26
11	10.6	15	8.2	8	7	-8	-24	...
12	10.4	7	8.0	-8	4	-8	-22	...
13	14.6	6	10.4	-38	6	3	-3	-14
14	14.7	1	10.0	...	0	2	-2	-11
15	14.1	-4	9.7	...	-4	-1	-4	-12
16	13.5	-8	9.2	...	-6	-2	-5	-13
17	13.0	-11	8.9	...	-7	-3	-6	-14
18	12.6	-14	8.7	...	-8	-4	-6	-14
19	12.6	-13	8.7	...	-7	-4	-8	-17
20	11.2	-17	8.8	...	-6	-5	-10	-21
21	9.9	-31	7.7	..	-10	-12	-20	-34
22	9.3	...	7.2	.	-14	-17	-27	.
23	8.9	-39	6.9	..	-13	-18	-28	.
24	8.8	-30	6.8	.	-8	-14	-25	.

VK EAST — MEDITERRANEAN

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	9.2	-3	7.0	-23	0	-12	-28	...
2	9.2	-9	7.1	-34	0	-11	-25	..
3	12.8	0	10.0	...	2	0	-8	-21
4	19.1	6	14.7	...	1	6	5	0
5	24.7	8	18.9	..	-2	8	10	8
6	27.0	9	21.1	...	-3	9	12	11
7	26.3	10	21.5	...	-2	9	12	11
8	25.4	11	20.7	..	0	11	13	11
9	24.3	12	20.2	...	6	14	14	11
10	23.1	14	18.6	...	13	17	16	12
11	21.8	17	17.5	-22	21	21	18	11
12	20.8	20	16.6	6	28	25	19	11
13	20.1	23	16.0	27	33	27	20	10
14	19.3	24	15.3	37	35	27	19	8
15	18.4	25	14.9	42	35	26	17	5
16	17.4	26	13.6	46	35	24	15	1
17	16.4	27	12.7	46	33	22	11	-3
18	15.1	28	11.6	45	31	18	6	-10
19	14.0	29	10.7	45	28	14	0	-18
20	14.1	27	10.4	44	27	12	-2	-22
21	13.2	26	9.8	36	23	7	-7	-28
22	11.8	22	9.1	19	16	0	-16	-38
23	11.7	16	9.1	3	12	-1	-15	-36
24	11.4	10	8.6	-13	8	-3	-17	-37

VK SOUTH — MEDITERRANEAN

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	9.1	0	6.9	-16	0	-15	-33	..
2	9.0	-7	7.0	-28	0	-13	-29	...
3	13.1	1	9.7	...	3	0	-8	-21
4	19.9	7	15.4	...	2	8	6	1
5	23.0	9	18.9	...	-1	8	10	8
6	23.1	9	18.9	...	-3	7	9	7
7	22.9	9	18.7	...	-4	7	9	7
8	22.5	9	18.3	...	-2	8	9	7
9	22.1	10	17.9	..	0	9	10	7
10	21.3	11	17.2	..	6	12	11	7
11	20.2	14	16.2	..	13	15	13	6
12	19.0	17	15.2	-14	21	19	13	5
13	17.9	22	14.3	16	28	21	14	2
14	17.1	24	13.5	33	31	22	12	0
15	16.4	26	13.0	39	32	21	10	-3
16	15.8	27	12.4	43	31	19	8	-7
17	15.2	28	11.8	45	31	18	5	-11
18	14.5	28	11.2	45	29	15	2	-15
19	13.9	29	10.6	44	28	13	-1	-20
20	13.5	29	10.2	44	26	11	-3	-23
21	13.8	27	10.4	42	25	10	-5	-25
22	13.4	24	10.0	29	21	7	-7	-27
23	13.1	20	9.8	14	17	4	-9	-29
24	11.5	13	8.7	-3	9	-3	-18	..

VK WEST — MEDITERRANEAN

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	8.4	9	6.5	4	-5	-30	...	...
2	8.4	0	6.5	-9	-5	-26	...	..
3	11.9	4	8.8	-29	4	-5	-17	-36
4	17.9	8	13.8	...	7	8	3	-5
5	22.9	9	17.2	...	5	11	11	6
6	23.2	10	18.6	..	3	11	11	8
7	23.3	10	19.2	...	2	10	11	8
8	23.1	10	19.0	..	2	10	11	8
9	22.7	10	18.5	...	4	11	11	7
10	22.1	11	17.9	...	7	12	12	7
11	21.1	12	17.5	...	12	15	12	6
12	20.1	16	16.2	-19	20	19	14	6
13	19.0	20	15.3	13	28	22	15	4
14	18.1	23	14.5	33	32	23	14	1
15	17.4	24	13.9	39	32	22	12	-1
16	16.8	25	13.3	43	32	21	10	-5
17	16.1	26	12.8	46	32	19	7	-9
18	15.3	24	11.4	45	28	13	0	-19
19	14.2	25	10.6	45	25	9	-6	-27
20	13.3	26	9.9	44	22	4	-12	-36
21	12.5	27	9.4	43	19	0	-19	..
22	12.2	27	9.1	43	18	-2	-21	.
23	11.5	27	8.9	39	15	-5	-26	..
24	10.5	20	8.0	20	7	-14	-35	

VK EAST — USA/CARIBBEAN

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	19.2	7	14.4	...	4	8	6	0
2	16.8	8	12.7	...	7	7	2	-7
3	14.8	10	11.1	-33	10	5	-2	-15
4	13.5	12	10.1	-15	12	3	-7	-24
5	12.8	16	9.6	3	14	2	-11	-31
6	12.2	21	9.1	19	16	0	-15	-38
7	11.9	25	9.0	32	17	-1	-19	..
8	12.0	27	9.0	37	18	0	-19	.
9	12.0	28	9.0	41	19	0	-19	.
10	11.1	29	8.4	41	15	-6	-27	...
11	9.6	31	7.4	39	7	-19	..	...
12	9.6	31	7.4	39	7	-19	...	..
13	12.3	28	9.1	43	20	1	-16	...
14	10.7	30	8.3	41	14	-8	-30	...
15	10.8	23	8.3	24	12	-7	-27	..
16	15.0	19	11.5	4	20	12	3	-11
17	13.7	13	10.5	-19	12	6	-3	-18
18	14.3	7	10.8	..	7	5	-2	-14
19	17.0	7	12.8	...	4	7	4	-3
20	20.8	8	15.9	...	0	8	8	4
21	23.5	9	18.2	...	-2	8	10	8
22	24.5	9	19.3	...	-3	8	10	9
23	24.2	7	18.3	...	-2	7	9	7
24	21.9	8	16.6	...	0	8	8	4

VK SOUTH — USA/CARIBBEAN

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	21.0	8	15.9	...	3	9	8	3
2	18.3	9	13.9	...	7	9	6	-2
3	16.0	11	12.1	-37	11	8	2	-9
4	14.6	13	11.0	-19	13	7	-2	-16
5	13.7	16	10.3	-1	15	6	-5	-22
6	13.1	20	9.8	14	17	4	-9	-29
7	12.6	25	9.5	32	20	3	-13	-36
8	12.5	27	9.4	38	21	3	-13	-37
9	12.5	28	9.4	41	21	3	-14	-38
10	11.4	29	8.7	41	17	-4	-24	...
11	9.6	31	7.4	39	7	-19	...	...
12	9.6	31	7.4	39	7	-19	...	..
13	12.6	28	9.5	43	22	4	-13	-37
14	12.6	29	9.7	43	23	6	-10	-33
15	12.5	23	9.6	22	19	4	-10	-31
16	14.1	17	10.7	-4	17	9	-1	-16
17	13.6	10	10.2	-30	10	5	-3	-17
18	14.3	6	10.7	...	6	4	-1	-12
19	16.5	6	13.0	...	2	6	3	-4
20	19.4	6	14.6	...	-1	6	6	2
21	21.6	8	16.5	..	-4	6	8	5
22	22.6	8	17.6	...	-5	6	8	6
23	23.1	9	18.4	...	-4	7	9	8
24	23.2	9	18.2	...	0	9	10	7

VK WEST — USA/CARIBBEAN

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	18.9	6	14.2	...	-1	6	6	1
2	16.5	5	12.5	...	2	6	3	-4
3	14.5	5	10.9	...	4	5	0	-10
4	13.3	6	10.0	...	7	4	-4	-17
5	12.5	9	9.4	-28	9	3	-7	-23
6	12.0	13	9.0	-12	11	2	-10	-28
7	11.7	18	8.8	4	14	1	-13	-34
8	11.8	23	8.9	18	17	2	-13	-35
9	11.9	27	9.0	33	20	3	-14	-37
10	11.1	30	8.5	38	18	-2	-21	.
11	9.8	32	7.5	40	12	-13	-36	.
12	9.8	33	7.5	41	12	-13	-36	...
13	12.3	31	9.2	44	23	5	-11	-35
14	14.4	30	11.2	46	30	16	3	-15
15	11.7	27	9.0	30	19	3	-13	-36
16	11.6	20	8.9	11	15	2	-13	-34
17	14.7	17	11.4	-13	18	12	4	-8
18	14.0	11	10.7	-35	11	8	1	-11
19	13.4	5	10.2	...	6	5	-1	-12
20	14.2	2	10.7	...	2	4	0	-9
21	16.5	4	12.9	...	-1	5	4	-2
22	19.3	6	14.6	...	-5	5	6	3
23	21.4	8	16.5	...	-6	5	8	6
24	21.6	7	16.4	...	-4	6	8	5

HAMADS

TRADE ADS

● AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne and Mildura: Alpha Tango Products, Perth.

● WEATHER FAX programs for IBM XT/ATs *** "RADFAX2" $35-00, is a high resolution shortwave weatherfax, morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3-00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

● THE ANTENNA EXPERIMENTER'S GUIDE, by Peter Dodd G3LDO. 200 pages, 120 illustrations, includes material not previously published. Building simple RF test equipment for measuring resonance, Z and field strength. Antenna optimising & VHF modelling. Computer measurement & mathematical modelling. Masts and experimental antennas., Price $AUS25.00, inclusive of P & P & Airmail. Cash $AUS or Visa. Obtainable, Peter Dodd, 37 The Ridings, East Preston, West Sussex BN16 2TW, U.K.

FOR SALE NSW

● DECEASED ESTATE. TRIO SSB transceiver model TS510, s/n 920056; TRIO Remote VFO model VFO-5D s/n 910272; TRIO Speaker/Power supply model PS-150 s/n 920189; ICOM SSB solid state transceiver model IC-701 s/n 00055; ICOM Speaker/power supply model IC-701PS s/n 00301, 20 amps 10 mins. on/off (50% duty cycle); ICOM computerised remote controller model IC-RM3 s/n 01002; ICOM desk microphone model IC-SM2 s/n 07706. Includes instruction manuals. COLLINS transceiver model KWM-2; COLLINS amplifier model 30L-1; COLLINS Speaker/power supply model 516F s/n 61656; KW107 Supermatch (seems to match the above) s/n AT1095; YAESU Musen monitor scope model Y0-100 s/n 6G11004; DRAKE wattmeter model W-4; R L Drake Co SSR-1 communications receiver s/n 12967. Sale is by tender to WIA NSW Division, PO Box 1066, Parramatta NSW 2124.

● NATIONAL Panasonic transceiver RJX-1011D HF SSB/CW amateur transceiver, CW filter, T-notch filter, RJX-V1011 external VFO, RJX-S1011 speaker. Top class transceiver with all manuals and instruction books $1200. Niels VK2BKQ QTHR (02) 481 8781.

● TOWER 50ft, tilt-over, wind-up, complete with guys and HAM 2 rotator $450. Buyer to remove. Les VK2AFG QTHR (02) 683 4101.

● KENWOOD TS-440SAT HF txcvr complete with 270 Hz and 500 Hz CW filters excellent condition $1,500; KENWOOD PS-50 20 A heavy duty PSU $300; UNIDEN 2020 HF txcvr with CW filter $500. Above prices all negotiable. NALLY Tower good condition $800 ono purchaser to remove; SCALAR 3-el 14/21/28 Yagi good performer $500. Terry VK2ALG QTHR (060) 25 3292.

● YAESU FT-747GX c/w FM and mobile bracket vgc $850 ono or swap for IC- 735/TS430S (must have transverter facilities) with cash adjustment. Alan VK2DXE (02) 552 2950.

● STILL a few left Philips 828 with complete kit and full information to convert to 6 m (no-xtals) $60. Posted in VK. David VK2BDT (048) 21 5036.

● 1989 TO 1993 60 copies Amateur Radio $30 plus freight; FT-101B excellent condition with spare driver and final valves $400. R Henry VK2GZ QTHR.

● FT-901DM, HF xcvr with YD-148 base mike, inbuilt power supply, DC-DC converter, xcvr comes with modifications from CQ magazine, all cords and plugs s/n 8F-020667 including service manuals vgc $950; FL-2100Z linear amp with WARC bands, service manual s/n 080297 ex cond $1,000; MFJ 1.5 kW Tuner, black body, service manual ex cond s/n 026990 couple of months old $450; SP-901 External Speaker for the above $50; COMPLETE station, can separate $2,400. Steve VK2SPS (02) 9999 2933.

● LARGE QTY components mostly professionally reclaimed from working devices, includes caps, trimpots, FETs, opto-isolators, crystals, regulators, switch-mode toroids, heatsinks & lots smt devices, sockets/terminals. All at roughly 20% of wholesale less tax prices. For list/prices contact Colin VK2XXE on fax (02) 970 6636 or PO Box 634, Mona Vale NSW 2103.

● VALVES 807 (3) $10 ea, EF50 (6) $5 ea unused; KAYPRO portable (20 kg) computer, 10 meg disk, 4 meg software with all manuals $450; CITIZEN printer $125; HEWLETT Packard vectra computer 286 with 287 maths coprocess 1.44 meg $275. W. Senior VK2WS QTHR (067) 75 2158.

● SPECTRUM Analyser Tektronics, with service manual & module 1L20 in 545 B- frame, checked from Tucker Electronics USA, up to 4.2 GHz $1,500; CLARK mast, pump-up, with compressor, full length 5 m for portable use (12 V) $1,500; TV Transmitter 426 MHz, 10 m output material cost $525. Erich VK2WH (02) 958 1985.

● AEA PK900 TNC hardly used absolutely as new in carton c/w, handbook, all cables accessories $1,200 ono; YAESU YC500S frequency counter $350. Peter VK2APP QTHR (063) 83 6206.

FOR SALE VIC

● CUSHCRAFT R5 vert 1/2 wave 14 thru 28 MHz as new with 15 m 213 co-ax $400 ono. Stan VK3VJQ (051) 55 3475.

● DECEASED ESTATE. Icom 740 mint condition $850; 2 m Colinear vertical $50. L Gibson (03) 783 8714.

● IBM clone 386DX 25 MHz, 40 Mb hard disk, 3 1/2 and 5 1/4 fdds, mouse, 200 W ps, VGA, all in minitower case with monitor and Star NX10 printer. All in vgc. Several useful programmes available if required $900 ono. Harold VK3AFQ QTHR (03) 596 2414.

● TET-EMTRON TE-23M 20-15-10 minibeam assembled near new list $440 sell $250; VIC 20 Computer, RTTY-CW hi-tech software, BMC green screen monitor, 1541- II disc drive, disc case, 2 x PS, manuals, all working (no modem) for $150. Andy VK3UJ QTHR (03) 726 8879.

● SHACK Clean-out, last items remaining, Pye 469 MHz base repeater station, QQEO3/20 final, 1970 vintage, 19" rack mounting $60; US Army BC221AA freq meter, c/w calib'n book & spare valves exc condn $40; HILLS Tower, 2 section elevates to 14 m, c/w winch and brackets for tilt over $250. John VK3FH QTHR (03) 894 4298.

FOR SALE QLD

● YAESU FT757 good condition $850. Brian VK4BOW (018) 18 1274.

● LABTECH CRO mod Q0155 20 meg dual trace with probes, manual, original box as new s/n 6056232 $450. C Stennett VK4ECS (071) 25 3415.

● ARRL QSTs 1952 thru 1993 eight copies missing. Bill VK4QF QTHR (07) 870 8785.

FOR SALE TAS

● ICOM ICW21AT Dual-band handheld FM transceiver, 2 months old, rrp $1,200 asking $740. Extended RX coverage to 950 MHz, also airband, cross-band repeater, with manuals, original packing and circuits. Dennis VK7YAO (002) 24 0518.

WANTED VIC

● NALLY Tower, 2 section elevating to 14 m, pref Melb or Peninsula area. John VK3FH QTHR (03) 894 4298.

WANTED QLD

● LAFAYETTE com rcvr model HE30 photocopy of circuit/manual or any info will pay costs. Trev VK4ARB QTHR (07) 269 8848.

WANTED WA

● CAPACITOR vacuum variable approx 10-250 pF or similar. Please phone Peter Smith VK6AQ (09) 307 4960 AH or (09) 380 2722 BH.

● POWER SUPPLY 240 V AC input, 12 V DC 25 A output (to supply transceiver). Bill VK6LT QTHR (09) 457 1080.

● KENWOOD TL922 or TL922A HF linear amplifier in good condition. Steve VK6VZ (09) 298 9330.

MISCELLANEOUS

● THE WIA QSL Collection (now Federal) requires QSLs. All types welcome especially rare DX pictorial cards special issue. Please contact Hon. Curator Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350. **ar**

Editor's Comment

Continued from page 3

Greater Melbourne area, would like to be involved in the publication of *Amateur Radio*, we want to hear from you. Ideally we need people who have had some experience in print media, but most vital is a good knowledge of technical English. A sincere interest in the long-term future of the WIA is essential.

Can we hope for sufficient response so that some of us might soon be able to retire?

Bill Rice VK3ABP
Editor
ar

QSP News

WARNING

All Icom Transceivers and Receivers should always have serial numbers when purchased. The removal or altering of the serial number voids the warranty. For this reason, ensure this is not the case at the time of purchase.

Further, Icom Australia has a strict policy of not repairing units where the serial number has been removed. Among many other reasons, this ensures stolen units are not serviced. Please consider this when purchasing any secondhand equipment.

Please call our office for the name of your nearest authorised dealer, or should you have any queries relating to our warranty.

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National Sales & Marketing Manager
Icom Australia

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Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 2175, Caulfield Junction, Vic 3161, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
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Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "How to Write for Amateur Radio" was published in the August 1992 issue of AR. A photocopy is available on receipt of a stamped, self addressed envelope.

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ADVERTISERS INDEX

Amateur Radio Action 23
Coman Antennas 13
Daycom 5
Dick Smith Electronics 27, 28, 29
Emtronics 24, 25
ICOM OBC, 22
Kenwood Electronics IFC
Strictly Ham 7
Terlin Aerials 17
Tower Communications 55
WIA Divisional Bookshops IBC

Trade Hamads

M Delahuntly 54
RJ & US Imports 54
Peter Dodd G3LDO 54

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VK6	GPO Box F319 Perth WA 6001
VK7	GPO Box 371D Hobart Tas 7001
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VK9/VK0	C/o Neil Penfold VK6NE 2 Moss Court Kingsley WA 6026

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